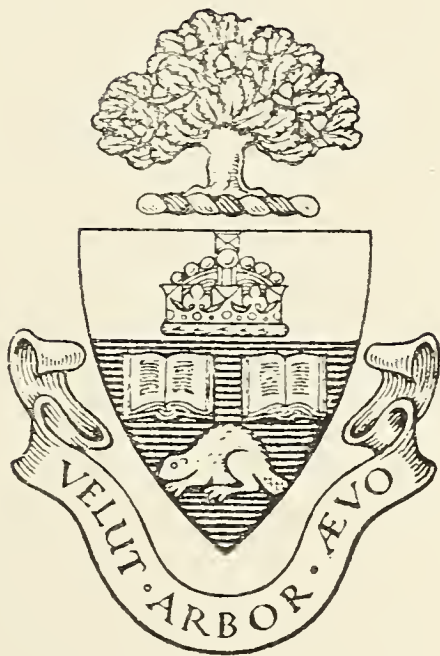


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UNIVERSITY OF TORONTO



REPORT OF THE DEAN  
OF THE  
FACULTY OF MEDICINE

*Session 1952-1953*

PRINTED AT THE UNIVERSITY OF TORONTO PRESS  
TORONTO, CANADA, 1954

## Report of the Dean of the Faculty of Medicine

Difficult as it may be to cultivate the New Year's spirit as we enter July with the academic session well behind us, it is one's duty to report to the President at this time of the year so that he, surveying the multifarious reports from divisions, colleges, faculties, and schools, may report to the larger constituency on the state and welfare of the University.

The academic session in Medicine was formally completed on June 17 when 159 young men and women were given their degree in Convocation Hall. Ten students failed to satisfy the examiners in all their subjects and will be required to write some of their examinations in the autumn. Dr. Victor Johnston, a family practitioner from Lucknow, Ontario, and a graduate of this University in the year 1924, gave the Convocation address.

On June 1, 75 members of the first class in the combined course in Physical and Occupational Therapy were given their diplomas. Major Edward Dunlop, G.M., of the Canadian Arthritis and Rheumatism Society gave the address. We were indeed sorry that Dr. Zinovieff, who has directed the course with such success since its inception, was unable to be here. He has returned to England and during the coming year Dr. Albin Jousse will direct the work of this division. We believe this experiment in the training of therapists has been attended by considerable success. A final assessment of its value must await reports from the various agencies for whom these newly trained therapists will work. There continues to be increasing interest and need for workers in the field of rehabilitation.

The student activities have been as interesting and varied as usual. Certainly the annual "Daffydil" show was the best of any performance since the war. Originality of music and script and good staging combined to provide an entertaining evening. The trio of medical students which constituted the Editorial Board of the *Varsity* produced a creditable and interesting paper, no easy task in the face of work in the final year in medicine. The *Medical Journal* maintained its standard of interesting articles, including student contributions.

Last autumn we admitted 125 students to the first premedical year. We had fewer applicants from whom to choose. We have just selected 40 students who will enter the first professional year. These are young men and women who have prepared themselves by taking an Arts or Science degree at our own or another university. Both last autumn and this spring the committee noted the fact that there is definitely a smaller number of applicants who can meet the admission standards. If this trend continues it may be a matter of some concern, and indeed at present the situation is in marked contrast to the years immediately following the war. The medical course is long and expensive; it demands good academic capabilities, and even after graduation it is the rule that at least one further year be spent as an intern. It may be that in these days of great opportunities in business and industry, good students, seeing the immediate prospect of gainful employment and security in those fields, are less attracted by the rather rigid requirements of preparation for the practice of medicine.

The research activities of the various departments are fully reviewed in the annual reports which follow. While the University provides the basic facilities and staff, the school is fortunate in its support from many national, provincial, and private foundations. Indeed, without such support, it would be impossible to carry on with much of the school's programme of research. We are particularly indebted this year to the Atkinson Foundation for very liberal grants to continue and expand the work in applied biophysics. The new laboratories will be housed in the Banting Institute as a sub-department of Pathological Chemistry, under the direction of Professor William Paul. The Foundation has underwritten the cost of procuring new equipment and providing the basic costs of staff for the next five years.

The Department of Obstetrics and Gynaecology announces a gift from Dominion Stores Ltd. which will enable a young, well-trained clinician to devote the major part



of his time for the next five years to clinical research and teaching. For the second time the Department of Medicine will enjoy support for a five-year period from the Markle Foundation, for a young physician who likewise will be able to devote his whole time to clinical investigation and teaching. The Bickell Foundation has continued its support to several departments. These grants, together with continued aid from many other foundations and national organizations, provide nearly half a million dollars annually towards the research activities of the school. There are frequent comments from colleges in the United States noting the increased administrative costs arising from such grants, and even suggesting that granting bodies should be prepared to add an amount of from 15 to 30 per cent in order to defray these expenses. However, it is probably the duty of the university to provide such basic facilities. The processing of such grants, the filing of applications, the writing of reports, and the integration of research programmes with the basic work of the department, certainly add to the load of work and expense, but the provision of extra help, even the maintenance and expansion of physical facilities, are surely not too great a price to pay for the tremendous support which present-day medical research receives from private, public, and government agencies.

The Alumni Association has again widened its already handsome programme of scholarship and bursary aid to the Faculty. All the existing scholarships have been increased by 50 per cent, and in addition a new scholarship in the final year was instituted and awarded for the first time this year. The annual dinner for the graduating class was held in Hart House on the evening preceding Convocation. It was attended by a large number of the class of '53 as well as some twelve members of the class of '03 who were guests of the Association. Principal Jeanneret of University College delivered a most thoughtful and stimulating address dealing with the doctor as a humanist, and showing how an interest in books is necessary in his everyday life.

We have news of a gift of \$4,000 from Dr. W. Duncan, an alumnus of the school, which will be used to redecorate and furnish space in the old Medical Building as a common room for students. The older graduates will remember that such a room, primitive it is true, existed in the basement of the Medical Building. With the advent of insulin, all that area was commandeered for laboratory space, and since that time there has been no place where students can meet. With the opening of the new Best Institute on College Street, and the movement of the Department of Physiology, space will finally become available. And speaking of buildings, the new Best Institute is rapidly assuming its final and complete external form, and it will be officially opened at a two-day series of meetings on September 15 and 16. The plans for the new institute of radiotherapy, after many revisions, are nearing a final stage, and it is hoped that construction will begin early next spring. The plans for the General Hospital also have gone through many variations and alterations, and as yet it has not been possible to call for tenders. As Professor Stokes reports, we have high hopes, with the support of the provincial Department of Health, of shortly achieving a new psychiatric centre which will be worthy of the steadily increasing needs in the dual fields of training and psychiatric care.

Postgraduate activities have continued along the same lines as in the preceding year. The generous support from the Kellogg Foundation has enabled us to take on another centre, Peterborough, in the scheme of decentralized postgraduate education. We continue to have good reports from the centres that are being served and we hope that the Foundation may maintain its support for another four years so that we can finally assess the best means of using this valuable, and we believe necessary, method of keeping the doctors in our section of the province abreast of the current problems and advances in medicine. There is a falling-off in the number of persons applying for training in some of the specialties, and indeed in such fields as oto-laryngology and ophthalmology there would be an insufficient number of men to fill the vacancies, were it not for candidates from outside Canada. Believing that we are taking practically all those from Canada who can qualify, we have this year accepted some five or six students from India. When they have completed their training here they will



return to teaching and research posts in their own country. Some of them will receive assistance under the Colombo Plan. It is hoped that a responsible university committee in India will send to us only those men who show good promise of returning to take up teaching posts at home.

Members of the Faculty were the recipients of many awards in all the different fields of medicine. Dr. William Butt was made a Fellow of the American Society of Anesthesiologists, and a Fellow of the International College of Anaesthesiology. Dr. S. M. Campbell was appointed Honorary Consultant to the Hospital for Sick Children and the Women's College Hospital. Dr. R. A. Gordon was re-appointed Consultant to the Director General of Medical Services, Canadian Army.

Dr. W. G. Cosbie was made a Fellow of the Society of Pelvic Surgeons of America and installed as President of the Society of Obstetricians and Gynaecologists of Canada. Dr. D. N. Henderson was elected a Fellow of the American Gynaecological Society. Dr. D. E. Cannell was elected a Fellow of the American Association of Obstetricians, Gynaecologists, and Abdominal Surgeons.

Drs. A. A. Fletcher and W. R. Campbell were each awarded the Banting Medal of the American Diabetes Association. Dr. Wallace Graham was elected an Honorary Member of the Pan-American Medical Association in January, 1953.

Dr. H. L. Ormsby was elected Chairman of a Committee on Ocular Bacteriology, Pan-American Association of Ophthalmology. Dr. R. G. C. Kelly was appointed Secretary of the Canadian Ophthalmological Society. Dr. Clement McCulloch was appointed Editor-in-Chief of the *Transactions* of that Society, and Dr. A. L. Morgan was appointed to the Council.

Dr. D. E. S. Wishart is President of the Canadian Oto-Laryngological Society and Vice-President and President-elect of the American Otological Society. Dr. J. A. Sullivan was elected a Fellow of the Royal Society of Medicine of England. Dr. G. A. Henry is a Fellow of the American Laryngological, Rhinological and Oto-Laryngological Society, and Dr. D. P. Bryce a Fellow of the American Academy of Ophthalmology and Oto-Laryngology.

Dr. J. A. Dauphinee was elected a Fellow of the Royal Society of Canada. Dr. G. H. W. Lucas was elected President of the Royal Canadian Institute. Dr. A. C. Singleton delivered the first Richards Lecture to the Canadian Association of Radiologists.

Dr. K. G. Gray was elected to membership in the Academy of Human Rights. Dr. A. B. Stokes is a member of the World Health Organization Expert Advisory Panel on Mental Health. He was also appointed by the Director General of UNESCO as a representative on the international panel of honorary consultants on brain research.

Dr. L. T. Barclay is President of the Canadian Society of Plastic Surgeons, and Dr. C. W. Harris, President of the Toronto Academy of Medicine. Dr. W. G. Bigelow was elected to the Society of University Surgeons, and Dr. C. S. Day, Dr. R. C. Laird, Dr. C. J. Robson, and Dr. W. K. Welsh have become Fellows of the American College of Surgeons. Dr. R. M. Janes was President of the American Association for Thoracic Surgery and became a Regent of the American College of Surgeons and an honorary Doctor of Medical Sciences of Laval University. Dr. F. G. Kergin was elected a Fellow of the American Surgical Association, and Dr. D. C. Robertson a member of the Canadian Association of Plastic Surgeons. Dr. Ian Macnab was awarded the 1953 Medal of the Royal College of Surgeons of Canada for his paper entitled "Structural Changes in the Lumbar Spine." Dr. D. R. Mitchell was President of the Northeastern Section of the American Urological Association and President-elect of the Canadian Urological Association.

Dr. William Gardiner was elected President of the Canadian Association of Physical Medicine and Rehabilitation. Professor C. H. Best was elected to honorary membership in the Australasian Society for the Advancement of Science. He received the honorary degree of LL.D. from the University of Melbourne and the honorary degree of D.Sc. from Laval University. He was awarded the John Phillips Memorial

Medal of the American College of Physicians, and elected Honorary Fellow of the Royal College of Physicians, Edinburgh.

Dr. Walter Campbell retires from active teaching on the public wards of the Toronto General Hospital, but will continue certain of his researches in the Department of Medicine. Others who leave us with the end of the current session, after years of valuable and faithful teaching, are Professors Edward Fidler in the Department of Physiology, A. E. MacDonald in Ophthalmology, E. A. Morgan in Paediatrics, and Dr. John Chassels in Anaesthesia.

I acknowledge again with pleasure and appreciation the helpful co-operation of the University officers, the administrators of our teaching hospitals, and as always, the unfailing and cheerful work of our own secretarial and administrative staff.

J. A. MACFARLANE



Medical Society

(September, 1952, to June, 1953)

<i>Honorary President</i>	. . . . .	Dr. J. A. MacFarlane
<i>Honorary Secretary-Treasurer</i>	. . . . .	Dr. R. F. Farquharson
<i>President</i>	. . . . .	A. R. K. Doyle
<i>Vice-President</i>	. . . . .	P. E. Blundell
<i>Treasurer</i>	. . . . .	C. D. Anderson
<i>Secretary</i>	. . . . .	D. J. L. Moran

The Medical Society controls and is directly responsible for all undergraduate clubs and organizations of the Faculty. The Society conducts a social, cultural, and athletic programme for the undergraduates and other extra-curricular activities that may arise according to the needs and the times.

The Arts and Letters Club enlarged its activities this year to include a Music Club and a Photography Club. Also included in its activities were those of the Debating Society, which not only conducted inter-year debates but also took part in the Hart House Debates; the Glee Club, which was the backbone of the annual “Daffydil” show; and the Osler Society at whose meetings many interesting papers were read by the students.

This year the *Medical Journal* changed its face and now sports a red jacket on which are printed the University of Toronto crest and the newly adopted Medical Insignia. This was a most successful year for the *Journal*, and as a result of the hard work of the staff, it was awarded the Frosst Trophy for the best student medical publication in Canada. An appreciation of this honour for the University of Toronto is entered in the minutes of the Students’ Administrative Council.

Close to 200 students combined their efforts to make this year’s “Daffydil” the most outstanding show to date. It was not only well received within the faculty but also on the campus and has been cited the “show of the year.”

The Medical At Home was held on February 18 at the Royal York Hotel and proved to be the outstanding function of the University social season. Almost 750 couples enjoyed the music, entertainment, decorations and the colourful, friendly atmosphere that makes the “Meds At Home” a highlight of medical functions.

The Medical Athletic Association conducted a programme of sports which included football, soccer, lacrosse, swimming, waterpolo, hockey, basketball, volleyball, golf, and tennis. Individual participation was high and Meds teams reached many important final positions in intra-mural sports. The year’s activities were concluded with a banquet at which many awards were presented to the Meds athletes.

The Medical Society has set up a special fund to aid in the decoration and furnishing of new common rooms which the Society hopes to obtain in the near future. During the past year the Common Room Committee painted, decorated, and increased the amount of room for tables and chairs in the common room in the Toronto General Hospital, much to the surprise and delight of the Medical years who felt that nothing could be done for it.

The Student–Staff Curriculum Committee worked hard to weed out the many ideas collected from responsible students, and next year, with one year’s experience behind them, should be able to offer concrete suggestions to the mutual benefit of staff and student body.

The local executive of CAMSI conducted a programme which included summer employment and intern placement services, the *CAMSI Journal*, and weekly films shown on Wednesdays at 1.00 p.m.

The Medical Society provided Christmas cards at cost for the students, and instituted a policy of uniformity in medical pins, rings, and blazer crests so that all years will have the same design.

On the campus Meds men and women were out in front and controlled many



campus activities. The Red Feather Campaign and the Red Cross Blood Donor Drive were directed by the President of the Medical Women's Undergraduate Association and many medical students took part in these drives. The editorial board of the *Varsity* was formed by three medical students, and the policies and publication of the *Varsity*, *Torontonensis* and the *Students' Handbook* were directed by the President of the Medical Society as Publications Commissioner. Medical students took active parts in the Home-Coming Weekend and in SHARE. Medicine was responsible for instituting a campus-wide drive for relief for the European countries devastated by storms during the past year. Medical students also made significant contributions to the life of the University by their work on the Students' Administrative Council, in Hart House, in the Blue and White Society, on the University of Toronto Athletic Directorate, and in many other student groups. Medical students have also been active in senior and intermediate intercollegiate football, hockey, waterpolo, and tennis.

By their efforts, inspiration, and aptitude for hard work medical students have without a doubt kept the Faculty in the forefront on the University of Toronto campus.

A. R. K. DOYLE

## Medical Athletic Association

(September, 1952, to June, 1953)

<i>Honorary President</i> . . . . .	Dr. W. T. Mustard
<i>President</i> . . . . .	J. W. McGillivray
<i>Vice-President</i> . . . . .	J. R. Gear
<i>Secretary-Treasurer</i> . . . . .	R. M. Ehrlich
<i>Quartermasters</i> . . . . .	A. S. MacPherson
	D. J. Scott
<i>IV Medical Representative</i> . . . . .	D. A. Barr
<i>III Medical Representative</i> . . . . .	J. R. MacKenzie
<i>II Medical Representative</i> . . . . .	B. R. Walker
<i>I Medical Representative</i> . . . . .	D. L. Schatz
<i>II Premedical Representative</i> . . . . .	R. E. A. MacDonald
<i>I Premedical Representative</i> . . . . .	A. G. Cecutti
<i>Publicity Director</i> . . . . .	H. A. Hyde

The Medical Athletic Association had a very successful year in organizing the athletic activities of the undergraduates and a large number of men participated in the programme although very little silverware was acquired. Thirty-seven teams with 386 players took part in the intramural leagues. In addition 84 men entered individual or tournament sports and 43 men played on University teams.

During the fall term the Association was represented with credit by one football team, two soccer teams, and five lacrosse teams. For the first time in undergraduate memory the Dr. W. A. Dafoe Cup was not won by our lacrosse team but we trust that this mischance will not occur again. However, our honour was upheld by our champion Junior Golf team and by Mr. V. N. Kyle who won the University Senior Golf championship.

The Medical Track Meet in October was well received and credit is due Mr. J. B. Bassingthwaite for his excellent organization. It is hoped that the track meet will be continued in the future.

For the sixth time in as many years the 5T3 volleyball team reached the finals and for the third time the Cup was won by these Grand Old Men. They have done much to stimulate interest in the sport within the Faculty (this year seven teams with 84 players) and their removal by graduation will be mourned.



In the spring term twelve basketball teams, seven waterpolo teams, and three hockey teams were entered with high hopes but they made little impression on the campus trophy cases. A squash tournament was held and the James Kinnear Memorial Trophy was won by Mr. J. W. Dawson.

In the competition for the T. A. Reed Trophy the Faculty of Medicine was again third this year.

The Medical Athletic Stick was awarded to Mr. J. W. McGillivray.

The final banquet at which Dr. W. T. Mustard presented a most entertaining paper on "The Athlete's Heart" climaxed the year's activities. A successful year is anticipated for 1953-4 with Mr. C. P. Vernon as President.

J. W. MCGILLIVRAY

Medical Women's Undergraduate Association

(September, 1952, to June, 1953)

<i>Honorary President</i>	Dr. Betty Stevenson
<i>President</i>	Dorothy Burton
<i>Vice-President</i>	Bernice Russell
<i>Treasurer</i>	Jean Wasserman
<i>Secretary</i>	Margaret Arnold
<i>Social Convener</i>	Elizabeth Oliver
<i>I Premedical Representative</i>	Margaret Norman

The Medical Women's Undergraduate Association had a successful year in 1953.

The freshies were entertained on a number of occasions: they were guests of the senior year for lunch at Diana's on registration day; for Sunday afternoon tea at the home of Miss Janet Huffman of II Premeds; at an initiation frolic and party afterwards at the home of Miss Joan Hopper of II Premeds; and at a freshmen's reception at the Women's Union.

The M.W.U.A. held an Initiation Banquet at the Colonial Room of the Royal York Hotel on October 14 with 85 students and guests attending. The formal initiation ceremony was performed with the senior students leading the Hippocratic oath. Dr. Jessie Gray introduced Dr. Betty Stevenson who gave an address on "The General Practice of Medicine." Keen interest was expressed by students in this talk which was well presented and not without abundance of good humour. After dinner the students were presented to the graduates.

A luncheon forum was held on October 9, when Dr. Helen Cunningham, a graduate of 4T7, visited Toronto and the M.W.U.A. Dr. Cunningham has spent the past three years in London, England, working with Dr. A. Lewis in Psychiatry. Her talk was based on the opportunities for postgraduate work in the British Isles, and she spoke enthusiastically of the desirability of taking a wide training, the availability of positions in England, mechanisms for obtaining them, salaries, and chances of continental holidays.

A Hallowe'en party was held at the home of Dr. Isobel Ayer for the undergraduates and the staff of the Women's College Hospital. "Daffydil" movies were shown and films of Dr. Ayer's trip to Italy. Specialist panels were held. Our thanks are due to Dr. Ayer for her interest in the student body.

A forum was held at the University School of Nursing on Medical Services in Saskatchewan, and Public Health and Industrial Medicine. Dr. Hacker, Dr. Brown, and Dr. Griffin were the speakers. The annual supper party was given on the last night of "Daffydil," two large boxes of toys going to the Settlement children.

The third medical year gave the final party of the year at Falconer House in honour of the senior year, with a skit, and an interesting address by Dr. Loughheed on part-time specialty and part-time general practice with the rest of the time spent as mother, wife, and housekeeper.

During the year medical women participated in such Medical Society activities



as the Osler Society, "Daffydil," the Medical At Home, the *Medical Journal*, the Music Club, the art display, and the Camera Club. They also took part in campus activities, the Carabin week-end, the Red Feather Campaign, and the Red Cross Blood Donor Drive.

In this round of social activities designed for undergraduates to become better acquainted with each other and with the graduates the U.A. seems to have been well served this year. Special thanks go to Dr. Betty Stevenson for her work as Honorary President.

DOROTHY BURTON

*Medical Women's Athletic Association*

(September, 1952, to June, 1953)

<i>President</i>	. . . . .	Sally Sarles
<i>Vice-President</i>	. . . . .	Marilyn Sonley
<i>Treasurer</i>	. . . . .	Diane Johnson
<i>Secretary</i>	. . . . .	Nancy Tuttle

This year Meds again entered interfaculty teams in baseball, basketball, hockey, and volleyball, and were represented in the bowling tournament.

Although none of the teams advanced beyond their leagues the basketball team forced a playoff for the league leadership, and the volleyball and baseball teams stood second and third respectively. Unfortunately the hockey team was unable to duplicate last year's championship and so lost possession of the Harston Trophy.

Early in the fall the Meds women participated in the track and field meet sponsored by the Medical Athletic Association.

As in former years women students from the Engineering Faculty and the School of Nursing were invited to participate in Meds athletics, and to come to swimming and badminton parties which were held after Christmas and were thoroughly enjoyed by those who attended.

The annual M.W.A.A. Banquet, held at the end of March, was well attended. On this occasion Dr. Irene Hain presented the following awards: two Junior T's, and two Third colours given by the University, and six Medical M's earned by participation within the Faculty. Dr. Jessie Gray, the guest speaker, gave a challenging and entertaining talk on "Women in Medicine."

SALLY SARLES

FELLOWSHIPS, SCHOLARSHIPS, MEDALS, AND PRIZES

*Awarded at Convocation, June, 1953*

GRADUATE

The William Goldie Prize . . . . .	C. J. Bardawill, Phm.B., M.A., M.D.
The Elizabeth Arbuthnot Dyson Fellowship . . . . .	M. J. O'Brien, B.A., M.D., F.R.C.P.(C)
The Graham Campbell Fellowship . . . . .	R. M. Clark, M.D.
The Graham Campbell Prize . . . . .	E. J. Stark, M.D.
The Percy Hermant Fellowships in Ophthalmology . . . . .	R. L. Hall, M.D. H. R. Hausler, M.D., M.A. M. Shea, M.B., B.Ch.
The Arch Hutchison Fellowship . . . . .	A. J. Hudson, M.D., B.Sc. (Med.)
The Lister Prize in Surgery . . . . .	W. J. McCracken, M.D., B.Sc.(Med.), F.R.C.S.(C)
The Alexander McPhedran Research Fellowship in Clinical Medicine . . . . .	P. M. Heywood, M.D.
The Starr Medal . . . . .	E. J. Stark, M.D.
The E. P. Taylor Fellowship in Oto-Laryngology . . . . .	T. Molony, L.R.C.P. & S.
The Helen L. Vanderveer Fellowship . . . . .	H. P. M. Higgins, M.D.
The James H. Richardson Research Fellowship . . . . .	A. J. A. Noronha, M.D., B.S.



FOURTH MEDICAL YEAR

The Cody Gold Medal . . . . .	E. D. Wigle
The Cody Silver Medal . . . . .	J. F. Mustard
The Cody Silver Medal . . . . .	J. W. Dawson
The Chappell Prize in Clinical Medicine . . . . .	J. F. Mustard
The Chappell Prize in Clinical Surgery . . . . .	E. D. Wigle
The Hendry Memorial Scholarship . . . . .	R. D. Longmore
The Ontario Medical Association Prize in Preventive Medicine . . . . .	Miss D. F. Burton
The Doctor Roy Simpson Scholarship in Paediatrics . . . . .	J. F. Mustard
The Class of 1924 War Service Scholarship . . . . .	E. D. Wigle
The Medical Alumni Association Scholarship . . . . .	H. Fields
The Butterworth Prize . . . . .	F. B. Fallis

THIRD MEDICAL YEAR

The Doctor Benjamin Cohen Prize in Obstetrics . . . . .	R. J. Watson
The Ronald S. Saddington Medal in Pathology . . . . .	E. Pike
The Sandoz Prize in Pharmacology . . . . .	H. P. Brent

SECOND MEDICAL YEAR

The John Copp Bursary . . . . .	J. B. Bassingthwaighte
The Posluns Brothers Scholarship . . . . .	Mrs. M. L. Cohen
The Sandoz Prize in Pharmacology . . . . .	G. S. Cohen

FIRST MEDICAL YEAR

The John Zoberman Scholarship . . . . .	H. J. Hoffman B. Langer, <i>aeq.</i>
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SECOND PREMEDICAL YEAR

The Famous Players Canadian Corporation Scholarship . . . . .	Miss B. Glozek
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REGISTRATION OF STUDENTS IN THE FACULTY OF MEDICINE

SESSION 1953-4

First premedical year . . . . .	125
Second premedical year . . . . .	116
First medical year . . . . .	150
Second medical year . . . . .	150
Third medical year . . . . .	155
Fourth medical year . . . . .	160
Art as Applied to Medicine . . . . .	5
Physical and Occupational Therapy . . . . .	294
Bachelor of Science in Medicine . . . . .	4
Diploma in Medical Radiology . . . . .	8
Diploma in Public Health . . . . .	20
Graduate students	
Psychiatry . . . . .	28
General . . . . .	52
	<hr/>
	1,267
Advanced graduate course (Medicine, Surgery, Obstetrics and Gynaecology) . . . . .	62

Anaesthesia

*Under the direction of Professor S. M. Campbell*

The Department of Anaesthesia has had its first year as an autonomous department and progress has been made in revising and expanding the teaching programme for both undergraduate and postgraduate students. For the third year in Medicine

there will be sixteen lectures in Anaesthesia instead of the previous eight. This will allow a much more complete coverage of the subject in all its aspects. In the fourth year more individual attention and the formation of clinical or tutorial groups by the clinical teachers have been encouraged in all the teaching hospitals. The improvement in the students has been quite noticeable in the final oral examinations.

During the year there have been fourteen postgraduate students taking the two-year course in Anaesthesia and we are grateful for the willing assistance of the members of other clinical departments and the basic science departments in giving necessary lectures.

Permission has been granted to appoint a Resident in Anaesthesia at the Toronto General Hospital and the Hospital for Sick Children. This will conform with the requirements of the Royal College of Physicians and Surgeons of Canada for a third year's training in the specialty for those wishing to take the Fellowship examinations.

The amount of clinical research in the Department has increased as shown in the attached report. Dr. S. L. Vandewater, the R. S. McLaughlin Fellow, has been most active in this phase of the work of the Department.

Dr. Clayton G. Bryan, Anaesthetist-in-Chief at St. Michael's Hospital, was compelled through illness to resign his administrative duties at the end of the last session, but we are glad to report that he has been able to resume, in part, his private practice. Dr. Joseph Vining has been promoted to Chief of the Anaesthetic Department at St. Michael's Hospital.

It is with regret that the resignation has been received of Dr. John Chassels, who has given thirty-three years of faithful service to the Department of Anaesthesia and the Toronto General Hospital as a clinical teacher and senior anaesthetist.

Dr. William Butt of the Toronto Western Hospital staff spent some time last summer visiting the Anaesthetic Departments of Edinburgh and Oxford.

Dr. Iain Mackay of the Toronto General Hospital staff is at present on two months' leave of absence in the British Isles visiting various centres.

### RESEARCH

Members of the staff have undertaken the following clinical research work:

Dr. Doreen Caplan and Dr. S. L. Vandewater, under the direction of Dr. R. A. Gordon, have carried out an investigation of anti-emetic drugs in the control of post-anaesthetic vomiting. Various methods of administering preparations of dimenhydrinate have been assessed and an investigation into the possible value of certain other antihistaminic and ganglion blocking drugs has been initiated.

Dr. R. A. Gordon has continued an investigation of the clinical value of hexylcaine hydrochloride (cyclaine) as a local anaesthetic drug.

Dr. I. M. Mackay and Dr. R. A. Gordon have made a controlled study of the clinical application of the various halogen salts of succinyl choline as muscle relaxants.

Dr. S. L. Vandewater under a R. Samuel McLaughlin Fellowship in Clinical Anaesthesia has carried out the following investigations: (1) the application of induced hypotensive methods in selected surgical cases by the use of methonium compounds and by total subarachnoid sympathetic block to diminish blood loss; (2) the intravenous use of Demerol combined with other agents in anaesthesia and prolonged post-operative analgesia; (3) the clinical use of phenothiazane derivatives to enhance the effect of analgesics, sedatives and anaesthetics and to prevent post-operative shock in major surgery.

Through the generous provision of an Oximeter by the Canadian Marconi Company, and with the assistance of a grant from the Insulin Fund, further studies of oxygen saturation of the blood in cardiac and chest surgery are being made.



PUBLICATIONS

CAMPBELL, S. M. "Complications in Cardiac Surgery"; in Panel Discussion, "Anaesthesia for Cardiac Surgery" (*Proceedings of the Canadian Anaesthetists' Society*, 1952, pp. 9-10).  
—— (in part). "The Teaching of Anaesthesia in Canada," Panel Discussion (*ibid.*, pp. 56-9).  
GORDON, R. A. "The Anaesthetist and the Bronchoscope" (*Proceedings of the Canadian Anaesthetists' Society*, 1952, p. 48).  
—— "Pins Can Save Lives" (*Canadian Hospital*, vol. 29, no. 11, Nov., 1952, p. 54).  
JUNKIN, C. I. "Anaesthesia for Hare Lip and Cleft Palate Repair" (*Proceedings of the Canadian Anaesthetists' Society*, 1952, p. 30).  
—— "Evaluation of Operative Risk and Choice of Anaesthetic for Cardiac Surgery" (*ibid.*, p. 6).  
STUBENSEY, L. A. "A Discussion of Anaesthetic Procedure for the Fenestration Operation (2,375 Cases)" (*Anesthesiology*, vol. 14, no. 3, May, 1953, pp. 303-10).

Anatomy

Under the direction of Professor J. C. B. Grant

During the year 1952-3 there were 690 undergraduate and graduate students working in the Department of Anatomy. They were distributed among the 24 courses mentioned below, as follows:

UNDERGRADUATE COURSES IN GROSS ANATOMY AND NEURO-ANATOMY:		
1. Medical, first year . . . . .	156	
Art as Applied to Medicine . . . . .	1	
Teachers' Course, Physical and Occupational Therapy . . . . .	2	
2. Dental, first year . . . . .	72	
3. Physical and Occupational Therapy, first year . . . . .	108	
4. Physical and Occupational Therapy, second year . . . . .	91	
5. Physical and Health Education, second year . . . . .	52	
Technicians in Radiography . . . . .	13	
6. Optometry . . . . .	21	
7. School of Embalming (Spring course) . . . . .	61	
	—	577
GRADUATE COURSES IN GROSS ANATOMY:		
8. M.S., F.R.C.S., and Radiology (evening courses) . . . . .	18	
9. Ophthalmology . . . . .	5	
10. Oto-Laryngology . . . . .	9	
11. Anaesthesiology . . . . .	7	
12. Dental Specialties . . . . .	8	
13. Demonstrators of Anatomy . . . . .	5	
14. Advanced Graduate Course in Surgery . . . . .	19	
15. Advanced Graduate Course in Obstetrics and Gynaecology . . . . .	8	
16. Graduate nurses . . . . .	0	
17. Graduate School . . . . .	3	
	—	82
UNDERGRADUATE COURSES IN HISTOLOGY:		
18. Medical, first year . . . . .	156	
Art as Applied to Medicine . . . . .	1	
19. Dental, first year . . . . .	72	
20. Physical and Occupational Therapy, first year . . . . .	108	
21. Physical and Health Education, second year . . . . .	52	
Dental Hygiene, first year . . . . .	6	
22. Physiology and Biochemistry, second year . . . . .	19	
	—	25
GRADUATE RESEARCH STUDENTS:		
23. Research students . . . . .	2	
24. Occasional students . . . . .	4	6
	—	
	TOTAL	690

Dr. J. V. Basmajian is at present on a six months' leave of absence studying advanced electromyography under Dr. Phillippe Bauwens in the Department of Physical Medicine, St. Thomas' Hospital, London.

Dr. S. H. Bensley received a Distinguished Service Award from the University of Chicago School of Medicine at a special convocation held in October, 1952.

Dr. J. W. A. Duckworth joined the staff as Associate Professor of Anatomy at the beginning of the academic year. He graduated from the University of Edinburgh in 1936 with the degrees M.B., Ch.B. He was a member of the staff of the Department of Anatomy, University of Edinburgh, from 1938 to 1952, except during the years he served with the Royal Navy (from 1939 to 1946), where he held the rank of Surgeon Lieutenant Commander R.N.V.R. In July, 1952, Dr. Duckworth proceeded to the degree M.D., and was awarded a gold medal for his thesis on "The Development of the Sinu-atrial and Atrio-ventricular Nodes of the Human Heart." He read a paper before the Association of Cardiologists of Great Britain on "The Anatomy of Congenital Pulmonary Stenosis" shortly before coming to Canada to take up his appointment.

Dr. A. W. Ham along with Dr. C. P. Leblond (McGill University) and Dr. R. L. Noble (University of Western Ontario) have been appointed by the National Cancer Institute of Canada to serve as the three members of its Research Advisory Group.

Mr. George A. L. Ross, Chief Laboratory Technician, has been admitted as a Serving Brother of the Order of St. John of Jerusalem. The announcement of this honour appeared in the *London Gazette*.

Mr. Charles E. Storton, Chief Technician in the Department, has assumed many responsibilities in connection with the Church and serves on several committees.

Miss Grace H. Dowsley, clerical assistant during the past thirty-six years, and Mr. James Shepherd, caretaker for twenty-three years, retire at the end of June. They carry with them the best wishes of all the members of the Department.

Professor W. J. Hamilton, Department of Anatomy, Charing Cross Hospital Medical School, London, who was visiting most of the medical schools in this country, spent a short time in Toronto during the month of May when he gave two lectures on the placenta. These were attended with interest by both anatomists and obstetricians.

Room 107, which for more than twenty years has been known and used as the office of the Medical Society, was urgently required as a research laboratory on account of its fixtures. Fortunately quarters which are equally commodious and completely satisfactory to the members of the Executive Committee of the Society were created by partitioning off a unit of room 115. Accordingly the office of the Medical Society has now moved across the corridor.

## RESEARCH

### *Under the direction of Dr. J. V. Basmajian*

Dr. Basmajian, in co-operation with Dr. Johanne W. Bentzon of the Hospital for Sick Children, continued the study of the functions of the muscles in the leg and foot. Many hundreds of records have now been made and a paper is being prepared for publication.

Dr. Basmajian is continuing the study of the anastomoses of the marginal arteries of the large intestine. The marginal arteries of the colon have been dissected in a series of almost sixty subjects over the past three years. There is definite evidence that previous concepts of these anastomoses are erroneous in part. When the series has been enlarged during the following year, the results should be ready for final analysis and presentation.

Dr. Basmajian is continuing also to study the measurement of the length of macerated long bones from subjects whose statures are known. Almost seventy sub-



jects have now been examined. The results are being analysed to determine the correlation between the length of the long bones and stature. These figures for Canadians should be useful in medico-legal work.

*Under the direction of Dr. S. H. Bensley*

Dr. Bensley, continuing the investigation of mast cells, has found that these cells increase in number in the connective tissues of the skin of the mouse after death of the animal and after soaking excised skin in physiological salt solution at room temperature.

The action of histamine on the tissues of the iris, in living albino mice, has also been studied by means of the quartz rod illuminator. It was found that histamine applied to the cornea of the eye not only produced interstitial edema of the iris but also induced intravascular agglutination of the circulating blood in the iridial vessels. The study of the development and behaviour of living mast cells in the eye has also been undertaken by this method.

Miss Patricia F. Stevens, on a grant from the Canadian Arthritis and Rheumatism Society, has studied the histological changes in the connective tissues and various organs of rats and hamsters following adrenalectomy and administration of cortisone and of histamine, alone and in various combinations.

*Under the direction of Dr. J. W. A. Duckworth*

Dr. Duckworth, since his arrival in Toronto, has continued his research on the sinu-atrial and atrio-ventricular nodes of the heart, with special reference to the changes that occur after birth and during the first three years of life. It is during this period that the heart becomes, at least from the functional point of view, linked up to the nervous system.

*Under the direction of Professor A. W. Ham*

Under the grant made to Dr. Ham from the National Cancer Institute and the Foster Bequest Fund the following work connected with the study of cancer was carried on during the year:

Dr. Marjorie M. Mosbaugh has shown that the Murphy lymphosarcoma, and the Novikov liver carcinoma, two commonly used transplantable tumours in rats, lower the resistance of their hosts by their growth, so that latent Bartonella infection, which is common in rats unless the strictest precautions are taken, may become sufficiently active to destroy their hosts. This finding has obvious importance because experimenters, unaware of this phenomenon, might attribute the effects observed by transplanting tumours in rats to the tumours instead of to a revitalized Bartonella infection. In this work Dr. Mosbaugh had the assistance of Miss Eve Kamenicek, who worked for the summer months on a grant from the Banting Research Foundation. With her, Dr. Mosbaugh has also shown that the type of leukaemia produced by injecting Murphy lymphosarcoma cells intraperitoneally into Bartonella-free rats varies, and may be influenced to some extent by different experimental procedures.

Miss Heidi H. Eartly, who visited the Department for eight months from the Department of Anatomy, McGill University, investigated the growth of the Novikov liver tumour in thyroidectomized rats that were fed a thyroxin-deficient diet and found, in a pilot experiment, that the tumour did not grow nearly so well under these conditions as in similar animals given thyroxin or in normal animals. She also made a histological study of liver regeneration and of the behaviour of fragments of liver transplanted to the subcutaneous tissues of partially hepatectomized rats.

Dr. Margaret I. Armstrong has begun the investigation of the carcinogenicity and possible chemotherapeutic effects of a series of compounds.

Mr. George A. L. Ross has taken over the work of maintaining the growth of liver tumours in fertile eggs and has supplied tumour-containing eggs to other departments for their studies. He has also been responsible for maintaining the Novikov



tumour in serial transfer in rats, and tumour-bearing rats have been supplied to other departments in this and other universities to facilitate their cancer research.

*Under the direction of Professor C. G. Smith*

Dr. Smith is endeavouring to provide landmarks useful to the surgeon in sectioning the pain paths at the junction of the spinal cord and the medulla. A careful study is being made to learn the relationship of the pain tracts and also the pyramidal tract to the site of attachment of the nerve roots in this region.

PUBLICATIONS

- ARMSTRONG, M. I., GRAY, A. E., and HAM, A. W. "Cultivation of 4-Dimethylamino-Azobenzene-Induced Rat Liver Tumours in Yolk Sacs of Chick Embryos" (*Cancer Research*, vol. 12, 1952, pp. 698-701).
- BASMAJIAN, J. V. "The Distribution of Valves in the Femoral, External Iliac, and Common Iliac Veins and Their Relationship to Varicose Veins" (*Surgery, Gynecology and Obstetrics*, vol. 95, 1952, pp. 537-42).
- "Electromyography" (*University of Toronto Medical Journal*, vol. 30, 1952, pp. 10-17).
- "A Ring-Shaped Medial Semilunar Cartilage" (*Journal of Bone and Joint Surgery*, vol. 34B, 1952, pp. 638-9).
- BENSLEY, S. H. "Pinacyanol Erythrosinate as a Stain for Mast Cells" (*Stain Technology*, vol. 27, 1952, pp. 269-73).
- GRANT, J. C. B. and SMITH, C. G. "The Musculature"; in *Morris' Human Anatomy*, pp. 399-609. New York: Blakiston Company, 1953.
- HAM, A. W. *Histology*. Second edition. Philadelphia, Pa.: J. B. Lippincott Company. 1953. Pp. 810.
- "Some Histophysiological Problems Peculiar to Calcified Tissue" (*Journal of Bone and Joint Surgery*, vol. 34A, 1952, pp. 701-28).
- HAM, A. W. and GORDON, S. D. "The Origin of Bone That Forms in Association with Cancellous Chips Transplanted into Muscle" (*British Journal of Plastic Surgery*, vol. 5, Oct., 1952, pp. 154-60).
- SMITH, C. G. "The X-Ray Appearance and Incidence of Calcified Nodules on the Habenular Commissure" (*Radiology*, vol. 60, 1953, pp. 647-50).

*Art as Applied to Medicine*

*Under the direction of Miss Maria T. Wishart*

The end of the current year 1952-3 marks the completion of another session of steady hard work. The standard and quantity of the work has been maintained. The number of persons making use of the Department's services has increased. Our illustrations have appeared in many scientific journals and have been shown at meetings and conferences in many parts of the continent.

Mrs. Ellen Melville has completed a series of graphs in colour for a monograph on "Lobotomy Research," by Dr. A. B. Stokes and Dr. A. Miller, Department of Psychiatry, to be published by the Department of Health, Province of Ontario.

Miss Elizabeth Blackstock has carried out some interesting studies for Dr. A. M. Rappaport, Banting and Best Department of Medical Research, on "The Subdivision of the Hexagonal Lobules of Hepatic Structural Units."

Mrs. Louise Gordon has continued work on further illustrations for Dr. A. W. Ham's revised Textbook of Histology.

With the resignation early in the year of Mrs. Gordon, Frosst Fellow in the Department, we lost an excellent co-worker. Mrs. Gordon retains her appointment as Instructor in the course of Art as Applied to Medicine. Mrs. Ellen Melville was appointed Frosst Fellow for the balance of the year.



The departmental work and teaching of students have been handicapped by our increasingly inadequate and inconvenient quarters. Within limits such discouragement can be met gracefully, but there comes a time when it destroys that quality of spirit so essential to good work. This injurious effect has been plainly noticeable this past year. We are, therefore, looking forward eagerly to the larger and more compact quarters which are to be ours on the fifth floor of the Banting Institute, when the Banting and Best Department of Medical Research takes possession of its new laboratories in the Charles H. Best Institute.

Our budget for equipment and supplies remains very modest. We have, however, been permitted to use our earned income to good advantage, and with it have purchased equipment, normally beyond the reach of our budget, in anticipation of quarters large enough to permit its use.

With experience, the method of teaching is gradually taking on a better-knit, more comprehensive form, with gratifying results. The demand for well-trained medical illustrators is increasing. These assets are offset by the comparatively small number of students enrolled. Interested enquiries re the course are numerous, but the number of applicants who qualify are few. The prerequisite requirements, training in the sciences and in art, are an unusual combination—all too often the student has one, not both.

It follows that to correct this shortage students should be informed as early as Grade X of the prerequisites. For this purpose, an occupational monograph, *Medical Illustration*, has been prepared for the use of teachers and vocational guidance directors. The effectiveness of this measure will not be apparent for several years.

Miss Elizabeth Marshall, of Montreal, a 1953 graduate in Art as Applied to Medicine, has been awarded the W. B. Saunders Company—University of Pennsylvania Fellowship in Medical Illustration.

In October, Miss M. T. Wishart, as President, addressed the Association of Medical Illustrators and representatives of St. Louis University and Washington University, St. Louis. She was appointed, for the third successive year, Chairman of the Education Committee, and Associate Editor of the *Journal of the Association of Medical Illustrators*. In January, Miss Wishart gave illustrated talks on “Design and Format” to the Medical Journalists’ Conference sponsored by the *Ontario Medical Review*, and on “Medical Illustration” to the Toronto General Hospital Alumni Association.

#### PUBLICATIONS

WISHART, Miss M. T. *Medical Illustration: An Occupational Monograph*. Toronto: University of Toronto Press for Department of Art as Applied to Medicine. 1953. Pp. 8, illustrated.

——— “Unity of Purpose” (*Journal of Association of Medical Illustrators*, vol. 1, 1953).

### Bacteriology

*Under the direction of Professor Philip Greey*

During the past year Dr. C. E. van Rooyen was appointed an Associate in the Department. Through lectures and demonstrations more detailed instruction in human virus infections was given than in the past. On completion of the C. H. Best Institute it is anticipated that several research studies on virus will be undertaken. Laboratory space was allocated for some of the work on “Ocular diseases of virus aetiology” under the direction of Dr. H. L. Ormsby, Department of Ophthalmology. Accommodation was similarly provided for a technician engaged in the study of various serological tests used in relation to patients with acquired haemolytic anaemia. This work was supervised by Dr. K. Butler of the Department of Therapeutics.



## RESEARCH

In the report for last year mention was made of the marked increased resistance to penicillin and other antibiotics of strains from infections caused by staphylococcus aureus which occurred in 1951. This study by Dr. P. H. Greey and Miss Joan Hennessy was continued throughout the past year. It is encouraging to note that a further increase in resistance was not encountered in 1952, for the percentage of staphylococcal strains resistant to the various antibiotics was very similar to that for 1951. In 1951 an increased incidence of severe staphylococcal infections was observed; this fortunately did not occur in 1952.

Dr. R. M. Price has continued her interest in the prophylactic vaccination against tuberculosis, particularly with a view to determining the duration of allergy in the vaccinated adult.

Dr. G. H. Hawks at St. Michael's Hospital has recently reported two cases of sporotrichosis found in Toronto. Dr. T. E. Roy at the Hospital for Sick Children has completed a study on the absorption of chloramphenicol, another on the prolonged penicillaemia which follows the intramuscular injection of benzethacil, and is investigating the absorption of ilotycin. He has continued to study the value of the haemagglutination test in tuberculosis, the acquisition of resistance of Myco. tuberculosis to various antibiotics *in vitro*, and has run comparative tests of the tube and disc techniques for sensitivity tests. Dr. Marion Ross at Sunnybrook Hospital has continued an investigation of the pleuro-pneumonia group of organisms and of the haemagglutination test in tuberculosis. Miss Joan Hennessy has studied the incidence of carriers of penicillin-resistant staphylococci in hospital personnel and the effect on bacteria *in vitro* of combinations of antibiotics, including the newer preparations. With Dr. Jean Hogarth, Department of Medicine, she has completed an investigation of the blood concentration of penicillin obtained in hospitalized patients following the oral administration of tablets containing different amounts of the antibiotic.

## PUBLICATIONS

- HAWKS, G. H. "Sporotrichosis: A Report of Two Cases from the Toronto Area" (*Bulletin of the Academy of Medicine*, Toronto, vol. 26, 1953, p. 106).
- HAWKS, G. H. *et al.* "Torulosis of the Central Nervous System" (*Canadian Medical Association Journal*, vol. 68, 1953, pp. 143-6).
- ROY, T. E., KRIEGER, E., CRAIG, GRACE, COHEN, D., MCNAUGHTON, G. A., and SILVERTHORNE, N. "Studies on the Absorption of Chloramphenicol in Normal Children in Relation to the Treatment of Meningitis" (*Antibiotics and Chemotherapy*, vol. 2, no. 10, Oct., 1952, pp. 505-16).

## Biochemistry

*Under the direction of Professor A. M. Wynne*

During the past year 346 students received instruction in the Department; of these 50 were registered in the School of Graduate Studies and 296 were undergraduates. The latter included 145 medical students, 82 dental students, 63 Arts students, and 6 students in the Faculty of Household Science.

Of the 50 graduate students 12 were registered in the Department for the Ph.D. degree and 5 for the degree of M.A. Three other students sponsored by the Department were registered in the School of Graduate Studies as "not proceeding to a degree." Of this group of 20 students, 9 are graduates of the University of Toronto and 11 are graduates of other universities. Most of the other 30 graduate students who received instruction in Biochemistry during the past year were enrolled in courses elected as minors.

Special lectures were delivered in the Department by Dr. Robin Hill of the University of Cambridge and by Dr. Gerhard Schmidt of the New England Medical



Center, Boston, both of whom came to Toronto as Visiting Lecturers under the auspices of the School of Graduate Studies.

### RESEARCH

Professor G. C. Butler and his graduate students have been actively engaged in the investigation of several fundamental problems. Mrs. M. A. Packham has continued her study of the metabolism of glucuronic acid by examining the fate of this substance, labelled with radioactive carbon, after administration to rats. Mr. L. H. Cohen has measured the rate of uptake of inorganic phosphate into each of the mononucleotides of ribonucleic and desoxyribonucleic acids in the muscles of the chick embryo. Mr. C. W. Helleiner has been engaged in isolating and identifying the products of the enzymatic and the alkaline hydrolysis of desoxynucleic acid. Mr. D. H. Murray has synthesized 2,4-benzylidene D-erythrose by a new procedure. This compound is to be used in the synthesis of C<sub>14</sub>-labelled ribose and desoxyribose. Mr. L. B. Smillie, who joined Dr. Butler's group in November, has compared three different procedures for isolating the proteins of cell nuclei. Mr. I. G. Walker has characterized the desoxyribonucleotides and nucleosides obtained from the hydrolysis of thymonucleic acid. Dr. Butler has served as a consultant in the supervision of the work of Mr. G. M. Healy who is registered for the Ph.D. degree in this Department and is conducting his research in the laboratory of Professor R. C. Parker in the Connaught Medical Research Laboratories.

Professor B. F. Crocker and three of his graduate students, Mr. C. J. Porter, Mr. Ian Maclean, and Mr. R. Holmes, have continued the study of enzyme formation in *Escherichia coli*. Mr. Porter has completed his investigation of the mechanism of formation of  $\beta$ -galactosidase and Mr. Holmes is pursuing the study of other aspects of this problem. Mr. Maclean's work was completed in November, 1952, and was concerned with a study of the formation of serine deaminase in *E. coli*.

The investigation of the digestion of fat in the dog has been continued by Mr. P. H. Odense under Dr. Crocker's direction.

Professor J. Manery Fisher completed a study of the composition of the tissues of Arctic mammals and she has continued her interest in the problem of the relationship between potassium ions and carbohydrate metabolism in frog muscle. Mr. L. B. Smillie was associated with Dr. Fisher in this work until November, 1952, when he completed a thesis for the M.A. degree.

With the completion of the remodelling of a laboratory for Professor C. S. Hanes and his research group, investigations on the synthesis of peptides are being actively pursued. Mr. G. E. Connell and Mr. G. H. Dixon are studying different enzymes which catalyse transpeptidations, and satisfactory methods have been evolved during the year for the quantitative study of these reactions. One object of the work is to determine whether reactions of this type are involved in the synthesis of protein.

Under the direction of Professor Wynne, Mrs. R. Sheinin completed a study of the oxidizing and phosphorylating activities of mitochondria and of other cellular fractions prepared from normal rat liver and from rat hepatoma induced by para-dimethylaminoazobenzene administered orally. During the past year Mr. T. Bojarski has investigated the enzymatic degradation of diphosphopyridine nucleotide by preparations derived from normal and malignant liver tissue.

Dr. C. G. Stewart completed an extensive investigation of the reaction of 2,4-dinitrophenylhydrazine with acetone. This work was undertaken because of the need for a rapid precise method for the estimation of minute quantities of biologically important carbonyl compounds. The reaction studied serves as a model of similar reactions between 2,4-dinitrophenylhydrazine and other carbonyl compounds. Dr. Stewart, who holds a fellowship of the National Cancer Institute of Canada, has resumed his study of the metabolism of  $\beta$ -hydroxybutyric acid in normal and malignant liver tissue.



Financial support for the several research programmes which have been carried out in the Department during the past year has been received from the National Research Council of Canada, the National Cancer Institute of Canada, the Research Council of Ontario, the Banting Research Foundation, the J. P. Bickell Foundation, the Defence Research Board of Canada, the University's Advisory Committee on Scientific Research, the Foster Bequest Fund, and the Insulin Fund. For the generous assistance so provided the members of the Department are grateful.

Graduate students have completed the following theses:

*For the M.A. degree:*

MACLEAN, IAN. The adaptive nature of serine deaminase in *Escherichia coli*.

SHEININ, ROSE. Investigations of the metabolism of succinic acid in normal rat liver and in rat hepatoma.

SMILLIE, L. B. Changes in the rate of oxygen consumption and in the potassium content of muscles caused by insulin and lactate in media of different potassium concentrations.

*For the Ph.D. degree:*

PORTER, C. J. The mechanism of the induced formation of enzymes.

#### PUBLICATIONS

HANES, C. S., CONNELL, G. E., and DIXON, G. H. "Transpeptidation and Transamidation Reactions"; in *Phosphorus Metabolism*, ed. W. D. McElroy and B. Glass, vol. 2, pp. 95-108. Baltimore, Md.: The Johns Hopkins Press. 1952.

KOPPEL, J. L., PORTER, C. J., and CROCKER, B. F. "The Mechanism of the Synthesis of Enzymes. I. Development of a System Suitable for Studying This Phenomenon" (*Journal of General Physiology*, vol. 36, 1953, pp. 703-22).

LAIDLAW, J. C. and YOUNG, L. "Biochemical Studies of Toxic Agents. IV. A Study of Ethereal Sulphate Formation *in vivo*, Using Radioactive Sulphur" (*Biochemical Journal*, vol. 54, 1953, pp. 142-8).

MOORE, A. M. "Growth Inhibition Studies. I. Measurement of the Effects of Inhibitors on the Growth Rate of Flax Seedlings. II. Sulphanilamide Inhibition and Its Reversal" (*Journal of Experimental Botany*, vol. 4, 1953, pp. 23-31; 32-40).

### Hygiene and Preventive Medicine

*Under the direction of Professor D. T. Fraser*

The staff feels encouraged to think that the teaching programme distributed over each of the four years is much more effective than formerly, when the subject was taught in the fifth year.

In the third year the instruction was given as far as practicable in seminar groups but not to the total exclusion of lectures. Because of the size of the class and the difficulty of obtaining adequate space for five groups at one time it has been found necessary to confine the teaching to the noon-hour period when rooms of the School of Hygiene are free of other classes. The staff agrees that this form of instruction is much more effective than lecturing and efforts are being made to extend the plan.

The joint undertaking of the Departments of Medicine and Hygiene and Preventive Medicine to offer instruction in Social Medicine was inaugurated in January, 1953. This elective course is offered to students of the third year. Students were interviewed by representatives of both departments and Miss Clarkson of the Social Service Department of the Toronto General Hospital and fifteen were selected. Through the co-operation of Dr. William Spaulding, Dr. Murray Young, Dr. John Cole, and Miss Clarkson, patients were selected from the out-patient department and wards of the Toronto General Hospital. The student acted as an observer of the patient and



family in the environment of the home. Frequent consultation between student and teacher was maintained. We are encouraged to believe that the course was enthusiastically entertained by the students and staff and its continuation is endorsed. Two cases were presented by the students to the class. We believe that this procedure was very successful for teaching the subject of Social Medicine to the members of the class not directly sharing the experience of their colleagues.

The summer internship in public health for members of the third medical year was offered. As reported in previous years, selected members of the third medical year have been attached to county health units for a period of three months during the summer. An opportunity is thus presented to the student to gain first-hand experience of the services rendered to the community. A practical demonstration of this sort materially supplements the didactic instruction of the classroom. It would be highly desirable that a larger proportion of undergraduates be offered field experience which is essentially limited by the financial support granted to this project. It is a pleasure to acknowledge the assistance of the Department of Health and Welfare through the Health Training Grant.

The total number of students receiving graduate instruction was 47. Of this number 2 were registered for the Ph.D. degree and 4 for the M.A. degree in the Department, and 5 others received instruction in subjects elected as minors.

As in previous years, it is evident that the University continued to attract students from many parts of Canada as well as from foreign countries. The enrolment of physicians for the diploma in Public Health for this session was 15. Of these 4 were from Ontario, 4 from British Columbia, 1 from Manitoba, 1 from Alberta, 1 from Haiti, and 3 from the British Isles. In other courses 2 students were registered for the diploma in Dental Public Health and 4 for the diploma in Veterinary Public Health. As in previous years, courses of instruction in Bacteriology, Immunology, and Virus Infections were given to these students, and also to suitably qualified graduate students. Three students proceeding to the Master of Applied Science degree were given a special course in Microbiology.

Laboratory courses and lectures were given as usual to the students in second-, third-, and fourth-year Pharmacy, second-year and third-year Household Science and Household Economics, third-year Physiology and Biochemistry, third-year Food Chemistry, third-year Physical and Health Education, and to students in the School of Nursing.

The total enrolment of students receiving instruction in the Department is 1,173 as follows: 14 candidates for the diploma in Public Health, 2 candidates for the diploma in Dental Public Health, 4 candidates for the diploma in Veterinary Public Health, 3 candidates for the degree of Master of Applied Science, 3 candidates for the certificate in Public Health, 2 candidates for the degree of Doctor of Philosophy, 4 candidates for the degree of Master of Arts, 2 graduate students not proceeding to a degree, 5 graduate students registered in other departments, and 8 candidates for the degree of Master of Science in Agriculture; 170 fourth-year medical students, 161 third-year medical students, 149 second-year medical students, 156 first-year medical students, 41 in the Household Economics course, 3 in Physiology and Biochemistry, 3 in Food Chemistry, 7 in Household Science, 41 in Physical and Health Education, 123 in the School of Nursing, and 172 in the Ontario College of Pharmacy.

## RESEARCH

Members of the staff have undertaken the following research work:

Dr. Milton H. Brown and Dr. Helen Plummer are investigating a suitable medium for the preparation of typhoid paratyphoid vaccine which will be free of a substance antigenically similar to the A substance of human red cells. The latter is present in abundance in hog's stomach and peptones hitherto used in the preparation of vaccine and toxoids. The study of the effect of ACTH on BCG infection has been



continued. The protective value of dried BCG vaccine has been compared to that of freshly prepared moist BCG vaccine.

Dr. F. H. Fraser has explored methods for the concentration of antibiotic from one of the strains of penicillium previously studied. Two antibiotic fractions were present. The dosage previously found adequate against *S. enteritidis* failed to protect mice against *S. typhosa*.

Dr. F. O. Wishart is investigating the effectiveness of concentrated diphtheria and tetanus toxoids given intranasally as a secondary stimulus.

Dr. R. J. Wilson has continued his investigations on a synthetic medium for the cultivation of *H. pertussis*, and the factors responsible for maintaining the cultures in the antigenic phase suitable for the preparation of vaccine. In collaboration with Mr. J. D. Wilson in the project relating to studies in rheumatism and arthritis, the studies in proteinuria in the normal male albino rat were extended. This project has been terminated and the results are ready for publication.

In pursuing his investigation of the action of chemotherapeutic agents in experimental tuberculosis Dr. C. O. Siebenmann studied the effect of combined chemotherapy using isoniazid in conjunction with streptomycin. In the early treatment of the tuberculous infection in mice this combination proved superior to the use of either drug alone. Dr. L. Rao contributed to the study of combination chemotherapy by making quantitative measurements of the *in vitro* antituberculous activities of isoniazid and a related hydrazone as well as of streptomycin using these drugs alone or in combination. Her results confirm the value of drug combinations of the isoniazid-streptomycin type.

Mr. D. Poulik and Mrs. J. McArthur are continuing their studies on the purification of diphtheria toxoid by continuous electrophoresis in filter paper. The apparatus for horizontal electrophoresis in filter paper has been completed and applied to the study of flocculation of diphtheria toxoid and antitoxin in an agar layer.

Dr. E. Kovacs has continued his studies on the enzymes present in the spinal fluid of normal and pathological specimens.

Graduate students have completed the following theses:

*For the M.A. degree:*

WILSON, J. DOUGLAS. Proteinuria in the male albino rat.

#### PUBLICATIONS

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———"Le Rôle de la médecine dans la guerre biologique, en ce qui concerne la défense civile" (*ibid.*, vol. 67, 1952, pp. 597-604).

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## Medicine

*Under the direction of Professor R. F. Farquharson*

There has been no change in the organization for teaching during the past year. Increasing emphasis, however, continues to be placed on consideration of the patient as a whole—his constitution and heredity, emotions, personality and environment—in diagnosis and treatment of disorders from which he suffers. This emphasis begins with the second-year teaching and is maintained throughout the course in ward teaching, formal lectures, and theatre clinics. The theatre clinics, each dealing with the medical problem of one patient, have a prominent role, especially in the third- and fourth-year courses. The weekly clinical-pathological conference in the final year is conducted from the same general point of view.

The Atlantic Dermatological Conference (Philadelphia, Washington, Baltimore, New York, Boston, Montreal, and Toronto) met in the out-patient department of the Toronto General Hospital on March 28. Thirty-five patients were shown and discussed.

The Department also co-operated with Professor Best and Professor Chute and various visitors in giving a week's course for the American Diabetic Association on diabetes. This was attended by physicians from all parts of the United States and many Canadian centres.

The retirement of Dr. W. R. Campbell is a great loss to the University. He will always be remembered for the large part he played in the initial clinical use of insulin. His students and, particularly, his house doctors and colleagues will remember especially his broad encyclopaedic knowledge of the medical sciences, his patience in giving freely of his time and knowledge to all who wished to learn, his great command of medicine, his sound judgment and common sense in the treatment of patients, and his clear, long-term aim for ultimate good results rather than temporary satisfaction. His contributions to medical knowledge have been outstanding and will continue. He commands the admiration, respect, and affection of all his colleagues.

## RESEARCH

### ARTHRITIS

Drs. Wallace Graham, D. C. Graham, and N. Swanson have been studying the mechanism of the action of colchicine in the treatment of gout. They have also reviewed the results of various methods of treatment of the painful shoulder. Dr. Ogryzlo has continued studies of diffuse rheumatoid disease, the L.E. cell phenomenon, and the effects of cortisone and ACTH in many disorders. He has made a careful study of the effects of ACTH and cortisone therapy on the insulin requirement of a depancreatized patient and reported his results.

### CARDIOVASCULAR DISEASES

The cardiologists of the three teaching hospitals continue the critical study of the use of anticoagulants in treatment of thromboembolic disorders. Dr. C. R. Burton and Dr. A. J. Kerwin have completed surveys of their results to date in cases of cardiac infarction, which indicate a reduction of mortality particularly in older patients and those with serious complications including passive congestion. Drs. R. L. MacMillan and K. W. G. Brown were unable to discover any essential difference in the results of therapy of a large series of patients using four different anticoagulants, namely; heparin, dicoumarol, phenylindanedione, and cyclocoumarol; working with Dr. F. C. Monkhouse of the Department of Physiology, they studied the effects of administration of heparin by different routes on the blood-clotting time and the blood heparin level. Studying mechanisms of blood coagulation, Drs. MacMillan and



Brown have also been using thromboplastin generation tests to differentiate between classical haemophilia and Christmas disease, a newly recognized haemophilic disorder with the same type of heredity but caused by deficiency of a different blood-clotting factor which is now called Christmas factor. Dr. K. W. G. Brown has also completed a carefully controlled study of the effect of heparin therapy in angina pectoris. It is interesting that both groups of patients did improve rather strikingly but those given a placebo did as well as those receiving heparin. Dr. J. K. Wilson, working with Drs. W. F. Greenwood and A. D. McKelvey, has completed a careful follow-up of patients with mitral stenosis seen at the Toronto General Hospital in the last fifteen years; in association with Dr. Bigelow of the Department of Surgery, they have published a report on the surgical treatment of mitral stenosis; the long-term results of this treatment in suitable cases have been very gratifying. Dr. A. J. Kerwin continues his work on the distribution of the cardiac currents through the body in an attempt to improve the electrocardiographic and vector cardiographic leads. Dr. Ramsay Gunton has been studying the accuracy and clinical usefulness of various methods of determining the blood volume using radioactive phosphorus, radioactive iodinated human plasma, Evans blue dye and carbon monoxide. The radioactive phosphorus method has been found the most useful. The blood volume of numerous patients with various diseases, including myocardial failure, has been measured and the effect of treatment observed; in co-operation with the Department of Surgery, the efficacy of Dextran as a plasma substitute has also been studied by this method.

#### DISEASES OF THE CHEST

Dr. H. E. Pugsley is developing, in co-operation with Professor Allcut of the Department of Mechanical Engineering, an artificial respirator for use in patients with respiratory paralysis and severe emphysema; breathing is augmented by means of rhythmic positive pressure applied to the abdomen during expiration. Dr. W. J. Hogarth, working with Dr. W. A. Oille and Professor P. H. Greey, has been studying the effectiveness of oral administration of penicillin and the effect of various factors on the blood penicillin levels at different times of the day. Dr. W. A. Rowland has been making a study on inflated lungs of the vascular changes in various chronic pulmonary diseases.

#### DERMATOLOGY

Drs. N. M. Wrong and R. C. Smith completed their work on the use of ACTH and cortisone in the treatment of self-limited skin diseases and reported their results. Drs. Wrong and E. J. Trow, Jr., are continuing the study of the use of mepacrine in the treatment of lupus erythematosus. A study of the effect of intramuscular administration of vitamin B<sub>12</sub> in patients with seborrhoeic dermatitis was completed; there was no clinical evidence that it was valuable.

#### GASTROINTESTINAL DISEASES

Drs. E. J. Maltby and R. C. Dickson have continued their studies on the effect of cortisone on the course of ulcerative colitis and Crohn's disease. Dr. Dickson has also been studying the effect of a gluten-free diet in idiopathic steatorrhoea and the electrolyte changes in post-operative patients. Dr. J. R. Bingham has nearly completed a careful study of the macrocytosis which occurs in patients with cirrhosis and other types of extensive liver disease; he is studying the bleeding defect in these disorders, and has also been working on the gastric secretory response to a caffeine test meal.

#### METABOLISM AND ENDOCRINOLOGY

Dr. W. R. Campbell has prepared for publication an article on the diagnosis and treatment of hypoglycaemia and hyperinsulinism, the result of a study covering the last thirty-one years. He has recently devised a rapid and accurate method for determination of calcium in blood serum, which was reported to the Royal Society



in June. Work on the adaptation of this method for calcium balance studies in man is proceeding. Dr. W. T. W. Clarke is continuing an active follow-up of juvenile diabetics and, in association with the Department of Obstetrics and Gynaecology, is studying pregnancy in diabetics. In conjunction with Professor J. A. Dauphinee and Dr. J. C. Sinclair, Dr. W. B. Spaulding has been studying changes in serum inorganic phosphorus levels after oral and intravenous administration of glucose in normal subjects, mild diabetics, and patients with liver disease. Dr. Spaulding has also made a careful study of the symptom fatigue and prepared a paper for publication on this work. Dr. W. A. Oille and Dr. Spaulding, in association with Dr. A. G. Gornall of the Department of Pathological Chemistry, have reported the unusual biochemical disturbance of a patient with secondary carcinoma involving the adrenal glands and presenting a picture of Cushing's syndrome. Dr. W. E. Hall has been studying electrolyte changes in patients with cerebral lesions. Dr. M. W. Johnston and Dr. J. Peller have been studying the effects of severe malnutrition on endocrine function and changes in thyroid function occurring in diseases of other endocrine glands.

#### NEUROLOGY

Dr. H. H. Hyland and Dr. H. J. Barnett have made a clinical and pathological study of the pathogenesis of cranial nerve palsies associated with intracranial aneurysms, and Dr. Hyland and Dr. D. Levy have reviewed all the verified cases of spontaneous cerebellar haemorrhage at the Toronto General Hospital. Dr. J. C. Richardson and Dr. A. M. Park continued the study of methods of treatment of ruptured intracranial aneurysms; they have also studied and reported cases of acute allergic encephalopathy due to serum injections. Dr. Barnett has been making a clinical and pathological study of diabetic neuritis. He has also been investigating the use of cortisone in treatment of patients with temporal arthritis.

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- BROWN, K. W. G. and MACMILLAN, R. L. "The Anticoagulant Effect of Phenylindanedione in Thromboembolic Disorders" (*American Journal of Medical Sciences*, 1953, vol. 225, pp. 495-500).
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- "Manifestations of Common Emotional Disorders Seen in Ordinary Practice" (*Ontario Medical Review*, vol. 19, 1952, pp. 389-94).
- FARQUHARSON, R. F. and JOHNSTON, M. W. "Simmonds' Disease (Extreme Anterior Pituitary Insufficiency)"; in *Current Therapy*, ed. H. F. Conn, pp. 388-9. Philadelphia, Pa.: W. B. Saunders Co. 1953.
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- KERWIN, A. J. "Common Cardiac Drugs" (*Modern Medicine*, vol. 7, 1952, pp. 27-32).
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## Obstetrics and Gynaecology

*Under the direction of Professor D. E. Cannell*

The undergraduate teaching in Obstetrics and Gynaecology was altered this year to provide more individual teaching in the final year. The major problems in Obstetrics and Gynaecology were covered in considerable detail. Both students and staff felt that this provided a much-needed improvement in clinical experience for the final year. The results of the annual examinations did not seem to justify these conclusions. A greater number of failures were recorded than heretofore. It is to be hoped that with certain modifications these changes will be justified by experience next year.

The third-year teaching still leaves much to be desired by reason of the large clinics and inadequate equipment. There seems to be little chance of altering the former, and in regard to the latter, a quantity of new equipment has been ordered and will be available for the opening sessions of the fall term. Greater stress will be placed upon the teaching of the basic principles of Obstetrics, particularly the mechanism of labour.



Postgraduate teaching was carried on in the advanced postgraduate course as well as the alumni refresher course and the Kellogg clinics. This, in addition to undergraduate teaching, results in heavy demands being made upon the time and effort of the members of the Department.

The Department is pleased to announce the successful attainment of Fellowship in the Royal College of Surgeons of Canada by Drs. J. L. M. Bean, F. E. Bryans, and R. A. H. Kinch.

Dr. W. H. Allemang has returned from sixteen months in Great Britain on a McLaughlin Fellowship to take up his duties in the Department at the Toronto General Hospital.

Dr. F. E. Bryans is presently in Europe on a McEachern Fellowship visiting and working in the foremost centers there and in Great Britain. He will return in 1954 to the Department at the Toronto Western Hospital.

Drs. R. A. H. Kinch and R. H. Wesley have been appointed Clinical Teachers and attached to the staff of the Toronto Western Hospital.

The Department is pleased to announce the promotion of Dr. W. H. Murby to the rank of Assistant Professor.

In the course of the past year the Dominion Stores through the interest of their President, Mr. J. W. Horsey, have made possible the appointment of a younger man in the Department to undertake the supervision of clinical investigation and teaching. This splendid and concrete support from this corporation is heartening evidence of their interest in the care of mothers and their offspring. Dr. W. H. Allemang will be the first holder of this fellowship. The Department wishes to express its sincere appreciation to the donors for their splendid contribution to the Department, and through it, to the community at large. It is hoped that the example given in this respect by Mr. Horsey and his colleagues may be emulated by others.

The usual scientific meetings of various general and specialist societies were attended by a large number of the staff. Contributions to the knowledge and advancement of Obstetrics and Gynaecology were made by several papers presented at national and international societies. At the annual meeting of the Society of Obstetricians and Gynaecologists of Canada the following members of the staff presented papers: Dr. G. L. Watt reported on "A Surgical Approach to the Management of Mitral Stenosis in Pregnancy" which will be of widespread interest and value in the treatment of such serious complications of pregnancy. Dr. Crawford B. Shier presented an interim report on "The Prognosis of Carcinoma of the Cervix Uteri by Vaginal Smear" which resulted from three years' work in this field. Dr. D. M. Low, in collaboration with Dr. W. L. Donohue of the Hospital for Sick Children, reported the results and conclusions drawn from the Rh committee's studies. This report was made possible by a contribution from the Banting-Best Research Foundation and is of significance in that it co-ordinated the maternal and foetal results of treatment of patients in this area who suffered from this complication of pregnancy.

Dr. T. C. Jewell reported upon the use of curare-like substances in obstetrics from a series of 225 private patients. Dr. Jewell's findings suggest this may prove to be a valuable adjunct in the management of difficult vaginal deliveries.

Dr. R. H. Wesley reported upon an interesting study of "Cervices Removed in Routine Total Hysterectomies at the Toronto Western Hospital in the Past Four and a Half Years." His findings demonstrated the value of this procedure in gynaecological surgery.

Funds have been made available from the National Health Grants to conduct an investigation of stillbirth and neonatal deaths. This work will be carried on in association with the Departments of Paediatrics and Pathology. Dr. L. E. Horne will be the obstetrical representative on the team.

Dr. W. G. Cosbie was given the award of the Society of Obstetricians and Gynaecologists of Canada for the most outstanding contribution to the specialty in the past ten years, and was installed as President of this body at their annual meeting in June.



The Head of the Department is grateful for the assistance received from the staff and voluntary assistants in the past year.

### RESEARCH

Members of the staff have undertaken the following research work:

Dr. D. M. Low has brought his studies on the Rh factor up to date and reported the results of this work.

Dr. D. J. Van Wyck has pursued his studies on Rh sensitization further in the past year. The number of patients studied is still too small to warrant any conclusions in regard to the value of ACTH in the prevention of erythroblastosis foetalis.

Dr. Crawford B. Shier has continued the cytological and biopsy examination of treated cases of carcinoma of the cervix. An interim report upon his findings was presented to the Society of Obstetricians and Gynaecologists at their June meeting.

Dr. G. L. Watt has investigated the surgical management of mitral stenosis complicated by pregnancy with satisfactory results in a small series of patients.

Dr. W. A. Dafoe of the Wellesley Division of the Toronto General Hospital has continued his studies on photoelectric colorimeter assay of pregnanediol and glutamic acid levels in blood plasma in conjunction with the Departments of Chemistry and Public Health Nutrition. The results of these studies should soon be available for publication.

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## Ophthalmology

*Under the direction of Professor A. J. Elliot*

The work of the Department of Ophthalmology increased during the session 1952-3, particularly in the graduate field. There were 13 postgraduate students



registered for formal training during the session. Dr. J. A. Halliday, Toronto, Ontario and Dr. J. H. Quigley, Halifax, N.S., were appointed Hermant Fellows in Ophthalmology. Dr. J. C. Ball, St. Catharines, Ontario, was appointed a Fellow to work on electroencephalography in strabismus cases, at the Hospital for Sick Children. Dr. R. F. Cowan, Stoney Creek, Ontario, was also appointed a Fellow to work on dark adaptation in the Defence Research Medical Laboratories. Four students completed their three-year postgraduate studies and will commence the practice of ophthalmology in various parts of Canada. Mr. C. A. Smythe, Toronto, Ontario, was awarded an ophthalmoscope donated by the J. F. Hartz Company as a prize for obtaining the highest mark in ophthalmology in the third year.

The Department was again the recipient of National Health Grants for "Ocular Diseases of Virus Aetiology" under the direction of Dr. H. L. Ormsby and for "Prevention of Blindness from Glaucoma" under the direction of Dr. T. H. Hodgson. The eye bacteriology laboratory and the glaucoma services continued to grow and were of service to the University hospitals and the profession at large.

Dr. A. E. MacDonald gave the President's address at the fifteenth annual meeting of the Canadian Ophthalmological Society in Banff. Dr. A. J. Elliot reported on "Visual Results in Carotid-Cavernous Fistulae"; in addition Drs. H. L. Ormsby, G. G. Cousineau, and L. A. Lloyd presented a "Survey of Ophthalmia Neonatorum," and Dr. John S. Crawford discussed "Proptosis in Children," at the same meeting. Drs. H. M. Macrae and R. W. Robertson gave a review of "Retinal Detachment Surgery" with moving pictures of the surgical technique and a statistical study of 180 retinal detachment operations. Dr. T. H. Hodgson discussed the role of the general practitioner in the diagnosis of glaucoma and Dr. H. L. Ormsby reviewed the use of cortisone in the treatment of eye diseases at the seventh annual meeting of the Medical Alumni Association of the University. Dr. J. S. Crawford reported to the Prosthetic Services Symposium of the Department of Veterans Affairs on "The Prescription of Ophthalmic Appliances." Drs. H. L. Ormsby and G. A. Thompson reported "An Experimental Study of the Broad Spectrum Antibiotics in Herpes Simplex Encephalitis in Mice" at the East-Central Section of the Association for Research in Ophthalmology in Columbus, Ohio. At the meeting of the American Diabetes Association in Toronto Dr. J. C. McCulloch discussed the ocular complications of diabetes. Dr. J. C. Hill lectured on plastic surgery of the eye and Dr. H. L. Ormsby discussed diseases of the eyelids at the American Academy of Ophthalmology and Otolaryngology, in Chicago. Dr. A. E. MacDonald attended the annual meeting of the Ophthalmological Society of the United Kingdom in London and gave a paper on "Topical Cortisone—Some Problems." Dr. H. M. Macrae spoke before the newly formed Ophthalmological Society of Ottawa on "Detachment of the Retina."

The Department was honoured by visiting lecturers. Mr. H. B. Stallard, F.R.C.S., London, England, and Dr. D. K. Pischel, San Francisco, were guest surgeons at the annual Eye Surgery refresher course which again proved to be very successful. The instruction consisted of lectures, operative clinics on patients, and cadaver surgery in small groups. The registration was limited to 30 and unfortunately a large number of applications over this number could not be accepted as it was felt a greater number of students could not be handled satisfactorily in a practical course in eye surgery. Mr. Harold Ridley, F.R.C.S., London, England, visited the University and lectured before the Academy of Medicine on his recent work with acrylic lenses in cataract surgery.

The undergraduate lectures in Ophthalmology to the medical students were presented in the third and fourth years as before. Particular attention was directed towards familiarizing students not only with local ophthalmological conditions, but also with the ocular manifestations of systemic disease. In addition, several lectures were given by members of the staff to the undergraduate students in the general courses in Physiology, Bacteriology, and Pathology.

The work of the eye pathology laboratory progressed well during the past year, under the direction of Dr. O. B. Richardson. The Department gratefully acknow-



ledges the large number of eye pathology specimens sent in by members of the profession. In addition to the monthly seminars in eye pathology, the laboratory served as a centre for postgraduate instruction. New additions were made to the departmental collection of microscopic specimens and photomicrographs for teaching purposes. Sets of study slides were sent to ophthalmologists in all parts of Canada.

The glaucoma laboratory continued to serve as a tonometer testing station for ophthalmologists. Ophthalmologists who know or suspect that the readings of their Schiøtz tonometers are faulty, are invited to make use of this station. The instrument should be forwarded to the Tonometer Testing Station, Room 84, Banting Institute, Toronto.

Professor A. E. MacDonald retired from the University staff on June 30, having reached the University retiring age. He served the University and the Toronto General Hospital faithfully for over twenty-nine years and his original contributions to the field of ophthalmology were numerous and significant. He was presented with a bound volume of his publications, suitably inscribed, at a dinner held in his honour.

### RESEARCH

Members of the staff have undertaken the following research work:

Under the direction of Dr. H. L. Ormsby, studies on ophthalmia neonatorum were continued by Dr. J. H. Quigley; this study has now completed its third year and over 5,000 babies have come within the scope of these investigations. In addition, Dr. J. H. Quigley and Dr. J. F. Ballantyne have made a study of antibiotic sensitivities of strains of staphylococcus aureus isolated from eye cultures. This work has had the full co-operation of Professors P. H. Greey and D. E. Cannell. Dr. J. A. Halliday has been working on the effect of magnamycin on infections of the eye, and also has conducted experimental studies with magnamycin and erythramycin on endophthalmitis. Dr. R. F. Cowan has studied *B. proteus* cases in human ocular infections and investigated the effect of gantracin on the control of these infections. Dr. Ormsby has investigated the use of radioactive phosphorus as a diagnostic agent in suspected eye tumours; this was in association with Drs. J. A. Dauphinee and W. Paul. In addition he worked with Dr. A. J. Rhodes in the Virus Laboratory of the Hospital for Sick Children, and under their supervision Dr. K. Funk used tissue culture techniques in an attempt to culture the virus of inclusion conjunctivitis in newborn and adult patients. In the eye bacteriology laboratory Miss R. Thomasson studied the effect of antibiotics and chemotherapeutic agents on the herpes simplex virus, employing animal *in vivo* and *in vitro* tests. It is hoped that newer tissue culture techniques may be employed to improve methods of assaying the various agents so that they may be used in the treatment of the human disease. Dr. Ormsby also directed the work of Dr. Anne Fowle, with the technical assistance of Miss I. Miller and Mrs. V. Simmons, in the study of strains of epidemic kerato-conjunctivitis, employing tissue culture techniques and attempting to improve methods of isolation in order to facilitate the epidemiological study of this disease in Canadian industry. This work was in association with Dr. C. E. van Rooyen at the Connaught Laboratories.

In the eye pathology laboratory Dr. O. B. Richardson and Dr. J. A. Halliday carried out work on special nerve stains to demonstrate the nerve supply of the aqueous veins of the ciliary blood vessels. This work was in connection with the glaucoma research project. Dr. J. C. Ball investigated the tissue changes in the extra-ocular muscles of children with strabismus.

Under the direction of Dr. J. C. McCulloch, Dr. R. F. Cowan has been working in the Defence Research Medical Laboratories in the Vision Section on problems of night vision. The work consisted of setting up equipment for testing of night vision as assessed by the Hecht-Schlaer apparatus. Investigations were made on the effect of ultra-violet light on visual acuity.

In the glaucoma research laboratory, under the direction of Dr. T. H. Hodgson,



a method for removing the salts in aqueous humour before testing for amino acids, by paper chromatography, was worked out by Miss S. Hennighausen. Dr. W. P. Callahan has solved the difficulties in connection with the electronic tonometer and its recording devices and this installation is now ready for clinical use. An intensive study on the flow of aqueous humour, using the fluorescein instillation method, was carried out on over 100 glaucomatous and normal patients by Dr. R. K. MacDonald and Dr. Hodgson.

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## Otolaryngology

*Under the direction of Professor P. E. Ireland*

Graduate and undergraduate teaching is the chief function of this Department. The graduate course attracts applicants from many countries, but there should be a limit to the number who are accepted from abroad. Our purpose is to train Canadian specialists as a first consideration. We have one student from India and one from Beirut, Lebanon, in the present group. During the summer term a member of the staff of the Radcliffe Infirmary, Oxford University, will join us for eight months. Our present graduates are all going to established centres. Dr. E. J. Stark is to join the faculty of the University of Saskatchewan. He has been honoured for his research in "local anaesthesia" by the Graham Campbell Prize in Otolaryngology and the Starr Medal.



There will be two changes in the Chiefs of Service in the University hospitals. Dr. D. E. S. Wishart, who retired to Graduate Lecturer last year, also relinquishes his positions as Otolaryngologist-in-Chief and Chairman of the Medical Advisory Board of the Hospital for Sick Children. He will be succeeded by Dr. J. B. Whaley who has been associated with him for many years. It is hoped that Dr. Wishart will continue to serve as a graduate lecturer and in the hard of hearing clinic. Dr. J. A. Sullivan's successor at St. Michael's Hospital has not been named at this time.

The past year has seen the development of a hearing centre at St. Michael's Hospital. Through a most generous contribution from the Atkinson Foundation, Dr. J. A. Sullivan and his associates have established a most complete and efficient hearing clinic. This is capable of a large volume of tests for the assessment of the problem of industrial deafness as well as experimental and research studies of all types of deafness.

The annual meeting of the Canadian Otolaryngological Society is being held in June under the presidency of Dr. Wishart. Drs. Ireland, McCart, Henry, Bryce, McAskile, and Statten will be represented on the programme. Dr. Sullivan has been invited to present a paper at the International Congress of Otolaryngology in Amsterdam, Holland, in June of this year. Professor Ireland acted as an examiner for the American Board of Otolaryngology in Chicago in October and in New Orleans in April. At the meeting of the Medical Alumni Association of the University of Toronto, Dr. B. W. Fearon presented a paper on "Treatment of Acute Ear Infections in Children" and Dr. B. P. Bryce on "Differential Diagnosis—Hoarseness."

The expansion of the department in the Toronto General Hospital with adequate facilities for the testing and treatment of the deaf and hard of hearing patient awaits the plans of the new building programme. It is hoped this will be started in the fall term. The "Lost Chord Club" which was initiated by this department to aid speech in patients with complete removal of the larynx has moved from the Toronto General Hospital to the headquarters of the Cancer Foundation. Speech therapy both before and after operation will continue under the direction of the Department of Otolaryngology, but will be carried on separately from the Club which is now largely a social organization.

#### RESEARCH

Dr. J. Brydon Smith, supported by the E. P. Taylor Fellowship, has continued his study of bone degeneration, under the direction of Professor A. W. Ham. He has also been associated with Dr. Walter Johnson in the experimental study of the nerve and blood supply to the labyrinth in order to study the effect of these on motion sickness. We are indebted to Dr. J. A. Sullivan and the R.C.A.F. for animals and laboratory space for this study.

Dr. P. Statten has continued his research in deafness in children at the Hospital for Sick Children. He and Dr. J. B. Whaley presented this work to the graduate course in Audiology held in Northwestern University, Chicago, in October, 1952. The use of psychogalvanic skin responses in the testing of pre-school children is also being continued by Dr. Statten and this research is being presented at the Canadian Otolaryngological Society in June.

Dr. D. P. Bryce is continuing the special study of nerve deafness in younger age groups at Sunnybrook Hospital, under Dr. C. A. Rae. A similar study in relation to industrial noise hazards is being initiated at the Toronto General Hospital by Dr. H. O. Barber.

Dr. H. W. D. McCart is continuing his clinical study of methods of treatment of bilateral laryngeal paralysis. A successful surgical procedure has been developed and is to be presented fully at the Canadian Otolaryngological Society meeting.

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## Paediatrics

### *Under the direction of Professor A. L. Chute*

Undergraduate teaching in this Department has been extended to include clinical as well as didactic teaching in the third medical year. Teaching in the final year is largely in the nature of a clinical clerkship augmented by student seminars.

A number of foreign and Commonwealth students have registered as graduate students in the Department. The Department has co-operated with the Committee on Postgraduate Studies in providing teachers to take part in clinics held throughout the Province. In addition many speakers have addressed local and provincial groups on paediatric topics.

Commencing in July, 1953, all interns at the Hospital for Sick Children are required to register as postgraduate students with the University of Toronto.

Research continues to play a large part in the activities of this Department as as outlined below.

### RESEARCH

Mr. Colin Cameron under the direction of Dr. A. L. Chute has completed a study of the effects of the administration of ACTH and cortisone to rabbits fed cholesterol. The general conclusions would indicate that neither of these substances was effective in removing atheromatous plaques once they had formed, but there was some evidence that in the animals which received ACTH concurrently with feeding of cholesterol there was some diminution in the incidence of atheroma. This project was supported by a "Processes of Ageing" research grant from the Canadian Life Insurance Officers Association.

Under a grant from the National Research Council, Drs. A. L. Chute and C. P. Rance continued their work on treatment with ACTH and cortisone of the nephrotic syndrome in children. Sixty-five children have now been treated, and almost 80 per cent have shown a remission of greater or less degree following one or more courses of treatment. The average duration of such remissions has been almost three months, but seven children have now been symptom-free for over a year. Five



children have been given injections of 6 per cent salt-free dextran solution, and in two this resulted in a considerable reduction of oedema.

Dr. H. W. Bain continued the comparison of NPH and globin insulins in the management of juvenile diabetes in the wards of the Hospital for Sick Children and at Illahee Lodge in Cobourg, Ontario.

The members of the Allergy Clinic are continuing their study on a comparison between the high dosage and low dosage methods of treating asthma, hay fever, and other allergic conditions. Drs. Collins-Williams and J. Vincent are conducting a study on skin test reactions to penicillin and on the incidence of penicillin sensitivity in children.

In the chest service, under the direction of Dr. Gladys Boyd, studies have continued on both tuberculous and non-tuberculous disease. The investigation of the Middlebrook-Dubos haemagglutination test by Dr. A. Josiukas, under Dr. T. E. Roy, has been concluded. The test appears to have very limited value as a diagnostic or prognostic tool.

The study of tuberculous bronchitis and bronchiectasis has been terminated as a research project, with well-substantiated findings. This project included more than 300 bronchoscopic studies, as well as careful study of pathological material obtained at operation and post mortem.

The new antituberculous drug studied this year has been isoniazid. Extensive studies have been made by the Department of Bacteriology upon its influence on tuberculous disease and the tubercle bacillus. Determinations of concentrations in body fluids, particularly the cerebro-spinal fluid, produced by oral administration have reduced the discomfort of therapy in tuberculous meningitis. The side effects which these drugs produce on patients suggest an adrenogenic or cortisone-like effect, even to the point of a Cushing-like syndrome. This has stimulated research into the 17 and 11 ketosteroid excretion and F.S.H. hormones, in patients under treatment.

Most of the above research has been supported by a Tuberculosis Control Health Grant.

The role of tuberculous pericarditis in the production of adhesive pericarditis in childhood has been determined. The diagnosis and treatment of the tuberculous form of the disease have also been studied.

Dr. J. A. Turner has completed respiratory studies on patients in whom pulmonary resection had been performed 15 to 20 years ago. He has also gathered data and made pulmonary function determinations on three cases of Ayerza's disease seen at the Hospital.

The congenital type of pulmonary cystic disease usually referred to as pulmonary sequestration has been studied from all possible aspects.

Dr. J. H. Ebbs and Dr. A. Sass-Kortsak have continued their studies concerning the behaviour of serum protein levels in infancy, with special interest in the gamma globulin fraction, under a grant from the National Research Council. In addition to the group of normal infants reported earlier, the following groups have been included in the study: (1) mothers and newborns delivered by cesarean section; (2) twins; (3) prematures. Attempts have also been made to adapt the method of paper electrophoresis for quantitative study of serum protein fractions. Satisfactory separation of five fractions (albumin,  $\alpha_1$ ,  $\alpha_2$ , beta and gamma globulin) have been obtained employing the method of Kunkel and Tiselius. Normal and abnormal sera have been analysed and typical patterns obtained. Possibilities for quantitative analysis are presently under exploration. The method of starch electrophoresis is also being studied with the aim of investigating the lipoproteins of normal and abnormal sera.

Dr. Ebbs has continued the study of children suffering from coeliac disease including the effect of the wheat-gluten factor in this disease.

Dr. D. Fraser has been carrying out certain studies on rachitic infants and children. In particular, interest is being directed towards the frequent finding of



amino-aciduria in both simple rickets and vitamin D resistant rickets. In the latter syndrome an attempt also has been made to elucidate further the nature of the derangement in metabolism.

During the past year the study of the psychological aspects of diabetes was completed by Dr. Mary Eddis and Dr. Wm. A. Hawke under a National Mental Health Grant. In addition a study was made of the attitudes of parents towards referral to a psychiatric clinic. The parents selected were those whose children had been admitted to the hospital for investigation of complaints which were primarily thought to be of organic origin but which were ultimately proven to be of emotional origin.

Dr. J. S. Prichard and Dr. S. Balakrishnan have investigated the effectiveness of new anti-convulsant drugs. Mysoline proved to be very effective in the treatment of grand mal seizures. The results of treatment of petit mal attacks with milontin have been rather disappointing. The effects on the electroencephalogram of solutions designed to (1) increase the osmotic pressure of the extracellular fluid without alteration of pH and (2) produce the same change in osmotic pressure with, in addition, change in pH are being studied. With the aid of a National Health Grant, Dr. Prichard and Dr. J. Ball have been studying the electroencephalographic changes found in children with squints and the abnormalities produced in these children by photic stimulation.

Dr. Andrew Hunter has had under study the application of his new method for histidine to the determination of that substance in urine. Urine contains so many interfering substances that a direct application is not possible; but most of the interference can be eliminated by absorbing the base on a certain synthetic resin, from which it can be eluted with sulphuric acid. The conditions are now being defined under which the absorption shall be as nearly as possible quantitative.

Dr. S. H. Jackson has completed long-term studies on the retention of fluorine. They reveal that the body content of fluorine reaches a plateau at a level proportional to the fluorine content of the diet, and that fluorine is not cumulative beyond this level. Nitrogen retention studies on heat-treated meat have been extended to commercial canning. It has been found that this process has no effect on the nitrogen retention. These studies have been supported by a grant from Canada Packers Ltd.

A method for the separation of amino acids by paper chromatography is being used in a study of urinary and blood amino acids in various interesting clinical conditions.

The use of a method for the identification of urinary sugars by paper chromatography has revealed a number of cases of galactosemia. Examination of parents and siblings of these cases did not reveal any abnormalities of galactose metabolism except in one family in which two cases of galactosemia have occurred. Dr. H. Bain co-operated in this study.

Micro-methods have been developed which allow analyses of various lipid components to be made on small biopsy samples.

Studies on hormonal balance in diabetic pregnancy, made in co-operation with the Department of Obstetrics, are being continued.

Drs. M. A. Cox, G. Nikiforuk, and S. H. Jackson are continuing studies of blood and salivary urea and its relation to dental caries. The studies are being made in co-operation with the Faculty of Dentistry and are supported by a grant from the Sugar Research Foundation. Blood and saliva samples have been collected from ninety-one public school students who have also had dental examinations by the provincial Department of Health. They were analysed for urea. The saliva samples were also tested for ammonia, rate of ammonia production on standing, and lacto-bacillus count. These studies are continuing.

Aided by grants from the University Advisory Committee on Scientific Research, the Canadian Arthritis and Rheumatism Society, and a National Health Grant, many cardiac and rheumatic problems have been studied by Dr. J. D. Keith and his assistants. A pathological study has been completed on transposition of the great vessels, and a detailed analysis of the clinical aspects of this condition has been



prepared. In conjunction with the surgical service a study of post-mortem cases has been carried out with a view to evolution of surgical procedures. Progress is being made along these lines.

A special study has been made of cases with total anomalous pulmonary venous drainage. This covers catheterization of children with this condition, X-ray investigation, oximetry, electrocardiographic studies, as well as clinical details.

A study is being carried out on various types of congenital heart disease from the electrocardiographic point of view. Special consideration is being given to the following conditions: fibroelastosis, left coronary artery off the pulmonary artery, pulmonary stenosis, aortic atresia or hypoplasia, total anomalous pulmonary vein drainage.

The co-operative study in rheumatic fever has continued. A preliminary report comparing the use of ACTH, cortisone, and salicylates in the acute phase of the disease is being prepared, embodying the data collected by the group as a whole. A report has already been made from this centre on the group of patients studied here. This work will continue for the next two to three years.

Assisted by a National Health Grant and in co-operation with the Connaught Medical Research Laboratories, Drs. A. J. Rhodes, W. Wood, C. C. R. Johnson, G. A. McNaughton, and L. N. Silverthorne have studied aseptic meningitis and short-term fevers in childhood with particular reference to the role of Cocksackie viruses. From the city of Toronto between July and November there were admitted to the Hospital for Sick Children approximately eighty patients with a clinical diagnosis of non-paralytic poliomyelitis (aseptic meningitis); during the same period only twenty patients were admitted with a clinical diagnosis of paralytic poliomyelitis. Laboratory investigations have been carried out on many of these non-paralytic patients; tissue cultures, monkeys, and suckling mice have been inoculated, and serological tests have been performed. The results suggest that in several patients suffering from aseptic meningitis Cocksackie viruses (Group B) played an important role; many such strains were isolated, whereas only a few poliomyelitis viruses were recovered. Observations made in 1952 and earlier years point to the role played by Cocksackie viruses in pyrexial illnesses of childhood in the summer months.

During the past year research work, supported by a grant from the Canadian Life Insurance Officers Association, has been undertaken by Dr. E. A. Morgan and Dr. A. J. Rhodes with the assistance of Dr. Elizabeth Zaiman on the aetiology of acute laryngo-tracheo-bronchitis. Particular reference was paid to the possibility of a virus infection. The cases selected were mostly of the acute variety and some required tracheotomy. The results so far obtained suggest that various bacteria may be responsible for cases of this disease and that the recognized viruses do not play a major role. The investigation is continuing.

Dr. M. J. O'Brien has reviewed and evaluated the symptoms, signs, and treatment of children with thyroid gland disease seen at the Hospital for Sick Children during the past twenty-five years. Observation and investigation by clinical and laboratory methods have been carried out on all children with thyroid disease presenting themselves on the public wards and clinics during the past year.

Dr. C. E. Snelling and Dr. B. Laski, in conjunction with Dr. Donohue and Dr. Cook of the Department of Pathology, Hospital for Sick Children, are continuing studies on leukaemia and related conditions. Folic acid antagonists and other chemical agents have been used as well as ACTH and cortisone. It has been found that ACTH is the most regular in producing remissions but eventually the value of this runs out. Under the direction of Dr. S. H. Jackson the observation of an abnormal urinary steroid chromatographic pattern in leukaemia has been confirmed and extended. It has not been found in any other condition except aplastic anaemia, which some consider to be a quiescent phase of leukaemia. Some clues to the chemical nature of this material have been obtained. These studies are continuing. Leukaemia studies have been aided by grants from the Ontario Cancer Treatment and Research Foundation, the National Research Council of Canada from funds made available by National Health and Welfare from National Health Grants, and the National Cancer Institute of Canada.



Studies are continuing on erythroblastosis foetalis. The indications are that replacement transfusion has decreased the mortality in our cases.

Dr. C. E. Snelling and Dr. W. H. Friday have investigated the end results in the cases of Banti's disease admitted to the Hospital for Sick Children over the past twenty years.

Aided by a National Health Grant, Dr. Elizabeth Chant Robertson has directed the analysis of the dietary surveys obtained at six-monthly intervals during the Canadian Red Cross Society's School Meal Study. Seventy-five low income families completed five consecutive surveys; 61 similar families did so on four occasions. It was found that except for 8 per cent of the families, great variations from survey to survey occurred in their intakes of calcium, riboflavin, thiamine, and ascorbic acid. The great majority of these families apparently bought their food in a haphazard manner. The advantage of acceptable, practical advice on food buying was evident.

Dr. Ford Walker, in the Department of Genetics, has continued her work on an objective diagnosis of mongolism based on an analysis of dermal configurations and has added to the series two cases of Japanese and one case of a Chinese mongoloid imbecile. In co-operation with the Neuropsychiatric Institute of the University of Illinois, she made a study of the symmetries of the dermal configurations of a pair of 15-month-old craniopagus twins, before they were separated surgically. In co-operation with Dr. Helen Battle of the University of Western Ontario, she is conducting a genetical and embryological study of a family group of 185 members in which for six generations there have been spontaneous and symmetrical amputations of the fingers and toes and twinning of the thumbs and great toes. The anomaly is genetic in origin and due to a single gene substitution. It is not due to amniotic bands, adhesions, or mechanical constrictions.

Dr. Irene Uchida is continuing her genetic investigations of rheumatic fever and leukaemia. The study of the former in conjunction with Dr. John Keith has almost been completed and a first report has been published. Up to the present time sixty families have been studied in the leukaemia investigation with Dr. W. L. Donohue. A group of twins with congenital heart disease is being gathered in conjunction with the Cardiac Service, and the family background for vitamin D resistant rickets is being investigated for Dr. Donald Fraser.

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## Pathological Chemistry

*Under the direction of Professor J. A. Dauphinee*

Dr. A. G. Gornall has been promoted to the rank of Associate Professor. No other changes have been made among the senior members of the Department.

During the past year 167 undergraduate students attended the courses in Pathological Chemistry. The change in the time-table, made this year, which allows the course to be given wholly in the third medical year rather than being spread over the second and third medical years as heretofore, has we feel been a good one, because it gives greater continuity to the work and allows a somewhat closer correlation between teaching given in our course and that which is given in the clinical departments.

Fourteen graduate students have been carrying out work in the Department. Four of these are candidates for the Ph.D. degree, two are taking Pathological Chemistry as a minor subject for their doctorate, and the remainder are working at various research problems but are not registered for a specific graduate degree.

### RESEARCH

Members of the staff have undertaken the following research work:

*Under the direction of Professor J. A. Dauphinee*

During the past year the close collaboration between this Department and the clinical investigation units and wards of the Toronto General Hospital and of Sunnybrook D.V.A. Hospital has been continued and extended to our great mutual advantage.

Dr. J. C. Sinclair of the Department of Medicine and Dr. R. Volpe of Sunnybrook Hospital have pursued with the help of our laboratory their investigations of patients with chronic liver disease. They have confirmed the favourable effect of testosterone on the nitrogen balance of these patients. They have continued their investigations into the electrolyte metabolism of this condition, hoping to arrive at a better understanding of the causes for the appearance of ascites. The sodium, potassium, and chloride content of saliva, sweat, and urine in these patients has been examined, with the object of trying to determine in this way if there is any abnormality in the metabolism or production of the salt-retaining hormones which would stimulate fluid to collect in the peritoneal cavity. With the help of Dr. Gornall's group the steroid hormone excretion in their urine has also been followed, and with the help of Dr. Nicholson and Dr. Ryley of this Department their kidney function has been carefully studied.

Dr. Sinclair with Mr. C. E. Downs and Miss Peppiatt has followed the total and free cholesterol and the total phospholipid content of patients with hepatic disease and have shown that the cholesterol fractions in particular are of considerable importance from a diagnostic and prognostic point of view.



In conjunction with Dr. Spaulding of the Department of Medicine the same workers have been carrying out different kinds of glucose tolerance curves on patients with hepatic disease, in an attempt to determine in what way the results can be distinguished from those obtained with the same procedure in patients suffering from mild diabetes mellitus.

Other problems which are being jointly studied by our laboratory and Sunnybrook Hospital include: (1) "The Effect of Salt Restriction on the Blood Pressure and Electrolyte Metabolism in Hypertension"; (2) "Electrolyte Studies in Starvation"; (3) "Electrolyte Studies in Uncontrolled Diabetes and the Effect of Insulin, ACTH, and Cortisone."

Dr. George Lowe and Dr. W. T. W. Clarke of the Department of Medicine and Mr. C. E. Downs have been studying the disturbances in diabetic acidosis and coma and the value of the administration of different remedial solutions. Advantage has also been taken of the opportunities to study with various clinicians the potassium disturbances which have been encountered in a variety of clinical disturbances.

Dr. Harold Kalant has developed a microfluorimetric analytical procedure for the determination of certain adreno-cortical hormones, and it is hoped that this may become a highly specific procedure for the measurement of individual compounds found in biological mixtures. With Mrs. O. J. Kalant of the Department of Physiology the above technique has been applied to a study of the factors influencing the *in vitro* release of hormones by surviving rat adrenal slices incubated in the Warburg apparatus. With Professor Sellers and Mr. Lee, also of the Department of Physiology, Dr. Kalant has made some initial investigations into the metabolism of thyroxine and tri-iodo thyronine in the tissues of normal rats and rats kept on prolonged intake of propyl thiouracil. Paper chromatography and radioautography of the developed chromatograms are being used to follow the fate of these hormones in muscle, liver, pituitary, and thyroid tissue after they have been administered in a labelled radioactive form.

Dr. Alan Bruce-Robertson, Canadian Arthritis and Rheumatism Fellow, has been working on the development of procedures for the separation of serum proteins by paper electrophoresis and for the quantitative determination of the various fractions, and is attempting to establish the optimum conditions under which these determinations should be carried out. When they have become fully satisfactory these techniques will be applied to the investigation of the different proteins in the blood of patients suffering from rheumatoid arthritis and from other rheumatic conditions.

Dr. Helen Johnston, the Helen Vanderveer Fellow, has investigated the methods for the determination of copper in tissues and in biological fluids and is applying these techniques to the study of copper excretion in various human ailments.

Dr. Gendron has been investigating with Dr. Lewis of the Department of Surgery the problem of ulcerative colitis. He has studied the injury produced by finely particulate silica on the bowel mucosa of dogs, and also the protective effect of powdered alumina on this lesion. With Dr. Tovee, also of the Department of Surgery, he has been examining, with the aid of radioactive phosphorus, the processes of bone repair which follow complete subcapsular separation of the neck of the femur in dogs.

Dr. Gagnon has worked with Dr. I. B. Macdonald of the Department of Surgery in his studies on organ transplantation and Dr. Stobie has been associated with Dr. Mustard, of the same department, in the development of techniques for local intra-arterial heparinization.

Mrs. Danoff has been examining the blood ammonia, blood amino acids, and other chemical blood constituents in the condition of hepatic coma, in an attempt to determine the reason for the development of the comatose state. These studies are being applied both to dogs, in which experimental coma has been produced by Dr. Rapoport of the Department of Medical Research, and to human patients suffering from this condition in the wards of the city hospitals.

In the radioactive laboratory Dr. W. Paul and Miss Amy Britton have continued,



with the help of a grant from the Ontario Cancer Treatment and Research Foundation, to be actively associated with the numerous investigations which are being carried out by various members of the staff of the Faculty of Medicine into the clinical uses of radioactive isotopes. These investigations include among others, (1) "The Use of Radioactive Iodine in the Diagnosis and Treatment of Diseases of the Thyroid Gland" (with Dr. M. W. Johnston, Dr. R. A. Mustard, Dr. J. Peller, and Dr. C. L. Ash); (2) "The Use of Radioiodine in the Treatment of Certain Patients with Severe Heart Failure or with Intractable Angina Pectoris" (with Dr. W. F. Greenwood); (3) "The Use of Radioactive Phosphorus in the Investigation and Treatment of Certain Blood Dyscrasias" (with Dr. K. J. R. Wightman and Dr. C. H. Bardawill); (4) "The Use of Radioactive Phosphorus in the Investigation of Tumours of the Eye" (with Dr. H. L. Ormsby); (5) "The Use of Radioactive Phosphorus and Iodinated Serum Albumin in the Determination of Blood Volumes" (with Dr. R. W. Gunton); (6) "The Use of Radioactive Phosphorus in the Investigation of the Healing of Fractures" (with Dr. F. P. Dewar and Dr. E. B. Tovee); (7) "The Use of Radiogold in the Treatment of Effusions into the Pleural and Peritoneal Cavities" (with Dr. O. B. Millar and Dr. C. L. Ash); (8) "The Use of Radiophosphorus in the Investigation of Brain Tumours" (with Dr. T. P. Morley and Dr. H. Botterell).

*Under the direction of Professor T. F. Nicholson*

Dr. Ryley and Dr. Nicholson, in collaboration with members of the Banting and Best Department of Medical Research, have continued the investigation of the nature of the stimulus to sodium excretion by the kidney and the site of the mechanism which stimulates the formation of granules in the juxtaglomerular apparatus. The investigation has been extended to include the effect of the blood pressure in the renal artery on the renal blood flow and glomerular filtration rate at low blood sodium levels.

Dr. Ryley, in collaboration with the group working under Dr. Dauphinee's direction at Sunnybrook Hospital, has continued the studies on renal function in patients suffering from hepatic conditions. This study has resulted in the collection of data on the largest group of non-ascitic cirrhotics reported to date.

Dr. Nicholson has made further studies on the effect of proximal glomerular damage on renal function. It has been found that a moderately severe proximal tubular degeneration impairs the ability of the kidney to re-absorb sodium, calcium, and chloride.

*Under the direction of Professor A. G. Gornall*

In the Steroid Hormone Research Laboratory Dr. Margaret E. Russell, who joined our staff during the year as Research Associate, has established on a sound basis the application of the 2,4-dinitrophenylhydrazine method to the analysis of steroid hormones in plasma. The method is being applied also to a study of steroid hormones that may be present in saliva and sweat. Miss A. M. Delaney and Mr. George Berner have assisted in this work and have also carried out the corticosteroid determinations in connection with clinical investigations.

Dr. W. G. Dobson has continued studies he initiated last year on the "Richardson Test" for the diagnosis of pregnancy. The test has been found incapable of distinguishing between non-pregnant women and women in the first trimester of pregnancy. The "Richardson-Rapp Test" on saliva, reputed to determine foetal sex in late pregnancy, has also been studied and shown to have an accuracy no better than approximately 50 per cent.

Mrs. C. Gwilliam has made a study of techniques of column and paper chromatography of the steroid hormones.

Miss D. Strachan has determined the 17-ketosteroids in all our clinical investigations and has made comparative studies of some recent modifications of the method.



In collaboration with Dr. W. G. Bigelow of the Department of Surgery, Mrs. M. Marten has continued our study of the steroid hormone excretion of ground-hogs. A great variety of extracts of the hibernating glands of these animals have been tested, and limited progress has been made in demonstrating that this tissue may contain an active principle that can influence cold tolerance.

In the Clinical Investigation Laboratory Mrs. C. E. Mullens, Miss F. Doane, and Mrs. H. Pavuls have carried out determinations of the metabolites of protein and fat excreted during metabolic studies of patients with various diseases.

The following problems have been investigated in collaboration with the clinical departments: (1) "Metabolic and Hormonal Abnormalities in Liver Disease"—with Drs. J. A. Dauphinee, J. C. Sinclair, and R. Volpe, Department of Medicine; (2) "Steroid Excretion and Metabolic Studies in Rheumatoid Arthritis, Gout and Diabetes"—with Drs. A. A. Fletcher, M. A. Ogryzlo, J. N. Swanson, and A. R. McNabb, Clinical Investigation Unit, Sunnybrook Hospital; (3) "Steroid Excretion and Metabolic Studies in Periodic Catatonia"—with Drs. J. Lovett-Doust, J. G. Dewan, and A. Bonkalo, and Mr. B. Eglitis, Department of Psychiatry; (4) "The Effect of ACTH and Cortisone on Serum Proteins, Steroid Excretion, and Rh Antibodies in Late Pregnancy"—with Drs. D. E. Cannell and D. J. Van Wyck, Department of Obstetrics and Gynaecology; (5) "The Steroid Hormone Excretion in Severe Malnutrition"—with Drs. M. W. Johnston and J. Peller, Department of Medicine.

#### PUBLICATIONS

- BARDAWILL, C. J., BRITTON, A., and WIGHTMAN, K. J. R. "Phosphorus Turnover in Normal and Leukemic Leukocytes (Abstract)" (*Journal of Clinical Investigation*, vol. 32, 1953, p. 553).
- DAUPHINEE, J. A. "Radioactive Isotopes in the Diagnosis and Treatment of Disease (Abstract)" (*Proceedings of the Royal Society of Canada*, Third Series, vol. 46, 1952, p. 155).
- DAUPHINEE, J. A. and CLARKE, W. T. W. "Metabolismo del potasio y posibles alteraciones en afecciones quirúrgicas y otros procesos" (*Archivos Médicos de Cuba*, vol. 3, 1952, pp. 526-33).
- FLETCHER, A. A., DAUPHINEE, J. A., and OGRYZLO, M. A. "Plasma Fibrinogen and the Sedimentation Rate in Rheumatoid Arthritis, and their Response to the Administration of Cortisone and Adrenocorticotrophic Hormone." (*Journal of Clinical Investigation*, vol. 31, 1952, pp. 561-71; *Treatment Services Bulletin*, vol. 7, 1952, pp. 309-10).
- GORNALL, A. G., EGLITIS, B., MILLER, A., STOKES, A. B., and DEWAN, A. G. "Longterm Clinical and Metabolic Observations in Periodic Catatonia" (*American Journal of Psychiatry*, vol. 109, 1953, pp. 584-94).
- GORNALL, A. G. and MACDONALD, M. P. "Quantitative Determination of the Steroid Hormone with 2, 4-Dinitrophenylhydrazine" (*Journal of Biological Chemistry*, vol. 201, 1953, pp. 279-97).
- RAPOPORT, A. "The Renal Control of Salt and Water" (*University of Toronto Medical Journal*, vol. 30, 1953, pp. 140-9).

### Pathology

*Under the direction of Professor John Hamilton*

During the past year the graduate teaching programme has been expanded. Dr. Wm. Anderson has instituted weekly lectures in Pathology for the interns. These have been attended by interns from the various teaching hospitals. Dr. R. C. Ritchie is giving regular instruction in cytological diagnosis to pathologists, and to the fellows and interns in Pathology.

The diagnostic service in exfoliative cytology is not being as widely used as anticipated, but is providing more than enough material for the training of technicians



and pathologists. This laboratory is being supported by the Ontario Cancer Treatment and Research Foundation for a second year.

Dr. H. J. Barrie has continued to reorganize the Army Medical Museum at Camp Borden. This project is also being supported for a second year by the Department of National Defence (Army). By courtesy of Lieut. Col. A. L. Kerr, O.C., R.C.A.M.C., a successful meeting with the orthopaedic staff was held at Camp Borden on May 28. The general principles of bone injury and repair were discussed and illustrated by specimens from World War I.

### RESEARCH

Members of the staff have undertaken the following research work:

Dr. J. D. Hamilton and Dr. R. M. Clark have been continuing studies on induced hypersensitivity in rabbits. Studies on the natural history of experimental glomerulonephritis were completed.

Dr. W. Anderson has been making a series of analyses, combined where necessary with follow-up histories of the patients concerned, of some of the material in the Division of Surgical Pathology. The following diseases have so far been studied: malignant polypi of the rectum (with Dr. A. McIntyre); carcinoma of the uterus (with Dr. W. G. Cosbie and Dr. M. L. Bunker); parathyroid tumours (with Dr. A. M. Edwards); parotid tumours (with Professor R. M. Janes).

Dr. J. K. Armstrong and Dr. B. G. Grapes have been studying the effect of intravenous injections of large molecular dextran on the rabbit kidney.

Dr. H. J. Barrie has been continuing his studies on various types of renal disease.

Dr. C. Ezrin has been studying the effects of severe undernutrition on the endocrine glands. With Mr. William Wilson of the Banting and Best Department of Medical Research, he has been investigating a new staining technique which, it is hoped, will clarify the origin of some of the hormones of the pituitary gland.

Dr. R. C. Ritchie in collaboration with the Department of Lands and Forests of Ontario is making a study of lymphosarcoma in Maškinonge (*Esox masquinongy*). He is also studying leucocytozoon infestation of ducks and grouse in co-operation with Dr. A. M. Fallis of the Ontario Research Foundation.

The Department is collaborating with Dr. Alice M. Goodfellow in a long-term investigation into stillbirths and neonatal deaths.

Histological facilities are being provided for several research projects in other departments.

### *Reported by Professor E. A. Linell*

Dr. M. W. M. Sloane has completed his investigation of thalamic lesions gleaned from the Division's files. He read a paper entitled "A Review of Thalamic Lesions" before the Pathology and Neurology and Psychiatry sections of the Academy of Medicine in March, 1953.

Dr. H. H. Hyland and Dr. D. Levy have collected the cases of cerebellar haemorrhage from the files of the Division of Neuropathology and are preparing a paper for presentation before the Canadian Neurological Society. Dr. Linell is giving a paper before the same society on Wernicke's encephalopathy.

### PUBLICATIONS

ASZKANAZY, C. L. "Sarcoidosis of the Central Nervous System" (*Journal of Neuropathology and Experimental Neurology*, vol. 11, Oct., 1952, pp. 392-400).

BARRIE, H. J. "Lipo-Cytolytic Cysts of the Renal Sinus" (*Bulletin of the Academy of Medicine*, Toronto, vol. 26, March, 1953, pp. 105-6).

BLANCHARD, A. J. *et al.* "Bronchogenic Carcinoma" (*Canadian Medical Association Journal*, vol. 67, Nov., 1952, pp. 431-5).

CRAWFORD, J. S. "A Case of Beriberi with Organic Changes in the Heart" (*Canadian Medical Association Journal*, vol. 67, Oct., 1952, pp. 356-9).



- DARTE, J. M. M., SNELLING, C. E., and DONOHUE, W. L. "The Effect of Plasma Infusions in Acute Leukaemia in Children" (*Canadian Medical Association Journal*, vol. 66, June, 1952, pp. 576-8).
- DONOHUE, W. L. "Alymphocytosis" (*Pediatrics*, vol. 11, Feb., 1953, pp. 129-39).
- *et al.* "Oxalosis" (*ibid.*, vol. 10, Dec., 1952, pp. 660-6).
- HAMILTON, J. D. "The Early Diagnosis of Cancer" (*Ontario Medical Review*, vol. 19, Aug., 1952, pp. 317-23).
- "Maladies du Collagène" (*L'Union Médicale du Canada*, tome 81, décembre 1952, pp. 1428-33).
- "The Origin and Spread of Cancer" (*University of Toronto Medical Journal*, vol. 30, Feb., 1953, pp. 191-4).
- "Pathology of Diabetes Mellitus" (*Diabetes*, vol. 2, May-June, 1953, pp. 180-3).
- HAMILTON, J. D. with DAVEY, P. W., and STEELE, H. D. "Radiation Injury to the Kidney" (*Canadian Medical Association Journal*, vol. 67, Dec., 1952, pp. 648-50).
- LINELL, E. A. "Neuropathology in the Ontario Mental Hospital Service" (*Ontario Medical Review*, vol. 19, Nov., 1952, pp. 416-18).
- MAUTNER, L. S. *et al.* "Thrombocytopenic Purpura Complicating Infectious Mononucleosis" (*Canadian Medical Association Journal*, vol. 68, March, 1953, pp. 268-72).
- OILLE, W. A., RITCHIE, R. C., and BARRIE, H. J. "The Age of the Lesions in a Case of Cardiac Sarcoidosis" (*Canadian Medical Association Journal*, vol. 68, March, 1953, pp. 277-8).
- ROSS, R. C. *et al.* "Coexisting Peptic Ulcer and Reticulum Cell Sarcoma of the Stomach" (*Archives of Surgery*, vol. 65, Dec., 1952, pp. 941-6).
- "Effect of Local Lesions on Experimental Breast Tumors Produced by 2-acetylaminofluorene"; in *Surgical Forum*. Philadelphia, Pa.: Saunders. 1953.
- "Observations on the histogenesis of breast tumors in rats receiving 2-acetylaminofluorene" (*Archives of Pathology*, vol. 55, March, 1953, pp. 173-180).
- WOLMAN, L. "The Origin of the Fibrous Tissue in Meningiomata" (*Journal of Neuropathology and Experimental Neurology*, vol. 12, April, 1953, pp. 194-200).

## Pharmacology

*Under the direction of Professor J. K. W. Ferguson*

The teaching of Pharmacology to medical students has now been transferred from the third to the second medical year. The second medical year seems to be the proper time to begin the study of Pharmacology. In order to secure reinforcement and repetition in a subsequent year, an experiment was inaugurated with the collaboration of the Department of Medicine. In the last three quarters of the third medical year, when the class is divided into three sections for clinical instruction, each section participated in a series of eight clinical-pharmacological conferences. Each student was given a definite subject to present to the group. Two clinicians and one pharmacologist were present to answer questions and guide discussion. The experiment has been encouraging and will be continued.

Professor W. Paul, who has been a valued member of the Department for more than five years, will leave the Department at the end of June to assume a full-time appointment, which might be called in England that of clinical physicist, in a new sub-department which has been made possible by a generous grant from the Atkinson Foundation. We hope that the loss of Dr. Paul will be more a matter of form than of reality and that the Department of Pharmacology will continue to enjoy his collaboration from time to time.

## RESEARCH

Members of the staff have undertaken the following research work:

Professor Ferguson, with the collaboration of Dr. R. D. Prueter and Mr. M. D. Warson, demonstrated that thyroid hormone given orally or by injection is less effective in female rats than in male rats. The greater resistance of female animals is



apparently due to an action of female sex hormone. A similar effect can be produced in castrated animals by a synthetic drug having the actions of female sex hormone.

A study with Mr. Warson on the activity of various derivatives of thyroxine is nearing completion.

With the help of Dr. W. Paul and Dr. D. M. Young (Connaught Medical Research Laboratories) radioactive iodine has been successfully used for the assay of thyroid-stimulating hormone. All three studies on thyroid pharmacology were assisted by grants from the Banting Research Foundation.

Dr. G. H. W. Lucas, with the help of Dr. W. Kalow and Mr. J. D. McColl, has continued a study of alcohol concentration in the breath of drivers involved in accidents, and drivers not involved in accidents. The Toronto Police have co-operated splendidly in this study, which was financed during the past year by a grant from the Attorney-General's Department of the Province of Ontario.

Professor Lucas, with the help of Miss M. O. Maykut, has continued a study of the effects of a number of local anaesthetics designed for very prolonged action. Financial support for this study was received from the Shouldice Surgery.

Professor W. Paul has continued his studies on photoelectric oximetry. He has developed a new refinement for his instrument to make its operation more automatic. The device may be called a servo-collator.

Dr. W. Kalow has completed an investigation of the absorption and fate of d-tubocurarine in the body by extremely sensitive micro analyses of d-tubocurarine in urine. Other studies on the effect of ionization on the activity of d-tubocurarine and methyl-d-tubocurarine are in progress.

Dr. B. Kalow has studied oxytocinase which increases in the blood plasma of women during pregnancy. The question under investigation is whether this plasma enzyme is the same as one found in erythrocytes of both men and women at all times.

Dr. E. J. Martin, working under a contract with Atomic Energy of Canada Limited, has studied the elimination of radon in the breath of human subjects who have radium fixed in their bones. Dr. Martin has demonstrated a remarkable effect of posture on the output of radon in the breath.

Dr. J. M. Parker, who holds a fellowship from the Canadian Life Insurance Officers Association, has continued a study of the pharmacology of derivatives of throphylline which may be useful in the treatment of pulmonary and cardiac diseases.

Dr. Eric Stark, E. P. Taylor Fellow in Oto-Laryngology, has studied the properties of a new local anaesthetic on laboratory animals and in clinical use.

#### PUBLICATIONS

FERGUSON, J. K. W., PAUL, W., and YOUNG, D. M. "Assay of Thyrotropic Hormone Using  $I^{131}$  in Intact Guinea Pig" (*Federation Proceedings*, vol. 12, March, 1953).

LUCAS, G. H. W. *The Symptoms and Treatment of Acute Poisoning*. Toronto: Clarke, Irwin and Company Limited. 1952.

PAUL, W. "An Oximeter for Continuous Absolute Estimation of Oxygen Saturation" (*Journal of Scientific Instruments*, vol. 30, 1953, p. 165).

PRUETER, R. D., WARSON, M. D., and FERGUSON, J. K. W. "Sex Difference in Resistance of Rats to Thyroid Hormone" (*Canadian Journal of Medical Sciences*, vol. 31, 1953, p. 99).

### Physiology

*Under the direction of Professor Charles H. Best*

Staff members and advanced students from many departments attend the weekly meetings of the Physiological Society, which if its precursor, the Physiological Journal Club, is included, has been in continuous operation for at least thirty-five years. Many outstanding advances, including the discovery of insulin, have been presented



for the first time to this group. In addition to the local contributions, addresses from the following scientists were heard this year: Professor R. A. McCance, University of Cambridge; Dr. E. Kodicek, Dunn Nutritional Laboratory, Cambridge; Professor Yngve Zotterman, Royal Veterinary College, Stockholm; Professor J. F. Brock, University of Cape Town; Dr. W. H. Fishman, Cancer Research and Cancer Control Unit, Tufts College Medical School, Boston; and Dr. A. H. Ratcliffe, University of Manchester.

Plans for modifications and improvements in the teaching programme preparatory to moving into the new Institute are being made.

### RESEARCH

Members of the staff have undertaken the following research work:

Dr. R. E. Haist and his colleagues have continued their investigation of factors affecting the growth of the islets of Langerhans. Mrs. I. MacDougall observed that prolactin administration caused a significant increase in the weight of the islets in hypophysectomized, but not in intact, rats. Mr. B. Kinash found that the daily administration of growth hormone preparations, ACTH and cortisone, occasions an increase in islet weights in hypophysectomized rats, and that growth hormone preparations and ACTH, though not cortisone, cause a significant increase in islet weights in intact rats. Continuous intravenous injection of ACTH, now under test, appears to produce a greater effect than injections of ACTH given once daily. The continuous intravenous infusion of glucose leads to a significant increase in islet weights when compared with the values in saline-infused controls. Dr. M. A. Ashworth has continued his work on the influence of diet on the islets of Langerhans. With Mr. J. B. Bassingthwaite he has been studying also the depressing effect on islet activity of excessively large doses of insulin.

Miss H. A. St. John has extended her work on the comparison of the efficacy of different infusion fluids in shock following limb-clamping, including a number of dextrans of different molecular size in the tests. Some aspects of the influence of aureomycin, noradrenaline, dibenamine, and 688-A on the development of shock were studied.

Further studies have been made on the influence of glands of internal secretion on glands of external secretion. Mrs. MacDougall has continued an investigation of the influence of the anterior pituitary gland on pancreatic trypsin, and Dr. Margaret T. Nishikawara has examined the changes in pancreatic amylase. A reduction in the total amount of these enzymes follows hypophysectomy, but administration of crude APE does not restore the values to normal. The administration of thyroid material along with the APE is now being tested.

Dr. J. E. C. Dorchester studied the effect of pancreatic damage on intestinal secretin. This work, which was interrupted by his acceptance of a position at the Jefferson Medical College of Philadelphia, is being continued by Dr. Nishikawara.

The research projects directed by Dr. E. A. Sellers are three in number: (1) physiological changes in the cold; (2) the effects of external radiation; and (3) the production of tumours of the thyroid and pituitary. Dr. J. W. Scott has collaborated with Dr. Sellers and Mr. N. W. Thomas in a study correlating the electrical activity of muscle with oxygen consumption and body temperature. Exposure to cold causes an increase in electrical activity before visible shivering takes place. The change in activity is more marked in normal rats than in animals acclimatized to cold. Dr. Rosemary W. You has continued nutritional studies in rats, with particular reference to the relative desirability of feeding diets high in fat, in carbohydrate, or in protein during exposure to cold. It appears that the caloric value of the foodstuff governs the amount ingested and is more important than the type of food offered. Mr. D. G. Baker has studied the use of alcohol as a food in the same connection. He has also started an investigation of the electrolyte changes after radiation delivered at rapid



and slow rates. Mrs. O. J. Kalant has extended earlier work on the rate of production of steroids from the adrenal cortex *in vitro* under various conditions.

Dr. J. C. D. Barlow has been in charge of the radiation project. A detailed study has been made of the alteration in resistance produced by prior irradiation or by exposure to cold before or after radiation. The effects of radiation given at a slow rate have been examined, especially in relation to the changes in the haematological pattern. Dr. F. C. Monkhouse has collaborated in the haematological and "clotting" phases of the experiments. Experiments on nitrogen balance and electrolyte changes occurring after radiation are continuing. The relationship of the endocrine glands to the changes caused by radiation is under investigation.

Mr. R. B. Lee, Dr. Jean M. Hill (who left the Department last year), and Dr. Sellers have reported the occurrence of chromophobic adenomas of the pituitary after prolonged administration of propylthiouracil plus thyroid extract to rats. Metastasizing tumours of the thyroid were larger with this treatment than when the goitrogen only was administered. These experiments are continuing in an attempt to explain the mechanism. Dr. Ingebord C. H. Radde has been associated with the study, and has observed disturbances in the female sexual cycle during the hormonal imbalance which is produced by the goitrogen.

In the section under Dr. J. Campbell, improved methods have been devised whereby the growth hormone of the anterior pituitary gland can be prepared in crystalline form and with a high degree of purity. These methods also improve the yields. Studies by Mr. J. S. Munroe and Mr. L. Chaikof indicate that the growth hormone may increase the rate of regeneration of plasma protein in dogs. Mr. T. Webb and Mr. Munroe are now applying radioisotope techniques to study of the rates of production of plasma proteins under the influence of the growth hormone. Mr. Chaikof has assisted in demonstrating that the purified growth hormone produces permanent diabetes in dogs under appropriate experimental conditions. Mr. H. A. Lindsay has been working on methods for measurement of the rate of tissue oxidations. Mr. Chaikof has studied the influence of the blood plasma from animals under various experimental conditions on the rate of production of sugar by liver slices. Mr. Munroe has made important observations on the relations of the adrenal glands to diabetes and the pancreas.

Experiments on irradiation have been continued in Dr. Edward Fidler's section, using the slow method of daily exposure to gamma rays from a  $\text{Co}^{60}$  source. In guinea-pigs and rats the blood cells were followed by Dr. F. C. Monkhouse and Miss H. L. Dickie. The results were not the same as in the dogs mentioned in last year's report. At a daily dose of 40 r., the guinea-pigs died with haemorrhage when the total dose approached 1200 r. and the platelets were still around 50,000 per cu. mm. of blood. At 20 r. daily, however, a distinct recovery phase occurred between the second and third week. The red cells and platelets returned to normal levels, but the leucocytes were less responsive. Rats were more resistant than guinea-pigs.

In co-operation with Dr. R. L. MacMillan and Dr. K. W. G. Brown of the Department of Medicine, Dr. Monkhouse has followed the heparin levels in the blood of patients receiving heparin by different methods of administration. Their report has been accepted for publication. Dr. Monkhouse collaborated in work at Suffield, Alberta, for the Defence Research Board during the summer of 1952. In collaboration with Dr. D. W. Clarke, work is continuing on the electrophoretic study of the heparin combination with serum albumin.

Dr. D. W. Clarke has continued work on the problem of the separation and concentration of an insulin-containing fraction of plasma. Studies on the complex formed by insulin and serum albumin with different substances have been pursued, using electrophoretic techniques. A paper dealing with the combination of bovine serum albumin and heparin is in preparation, as a result of a study made in conjunction with Dr. Monkhouse. Some preliminary work on the effect of insulin upon leucocyte metabolism has been undertaken. Mr. E. E. Sotiroff has completed his work in connection with the development of a suitable method for the measure-



ment of small quantities of insulin, using hypophysectomized, alloxan-diabetic rats. Miss E. L. Wong has completed her thesis, "Effects of Insulin on the Rat Diaphragm *in vitro*."

Dr. J. W. Scott, in addition to his own neurological investigations, has helped Professor F. R. Miller complete some of the latter's studies on the cerebral cortex.

Graduate students have completed the following theses:

*For the M.A. degree:*

LEE, R.B. The effect of propylthiouracil on the iodine content of the thyroid glands in rats.

MACDOUGALL, J. S. Sensory pathways of the spinal cord.

WONG, Miss E. L. Effects of insulin on the rat diaphragm (*in vitro*).

*For the Ph.D. degree:*

BARLOW, J. C. D. Studies on factors affecting the response of the rat to penetrating radiation of the whole body.

BROOKS, V. B. The action of botulinum toxin on neuromuscular transmission.

CASSELMAN, W. G. B. The physiological histochemistry of lipids, a study of methods and applications.

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ALLEMANG, W. H. "An Investigation of Histaminolytic Activity of Serum in Pregnancy" (*Canadian Medical Association Journal*, vol. 66, 1952, pp. 359-62).

ASHWORTH, M. A., KERBEL, N. C., and HAIST, R. E. "Effect of Chronic Caloric Insufficiency on the Growth of the Islets of Langerhans" (*American Journal of Physiology*, vol. 171, 1952, pp. 25-8).

BARLOW, J. C. and SELLERS, E. A. "Effect of Exposure to Cold on Response of the Rat to Whole Body Radiation" (*American Journal of Physiology*, vol. 172, 1953, pp. 147-51).

BRYANS, F. E., KINASH, B., ASHWORTH, M. A., and HAIST, R. E. "The Effect of Hypophysectomy on the Growth of the Islets of Langerhans" (*Diabetes*, vol. 1, 1952, pp. 358-62).

DORCHESTER, J. E. C. and HAIST, R. E. "A Method of Secretin Assay" (*Journal of Physiology*, vol. 118, 1952, pp. 182-7).

———"The Secretin Content of the Intestine in Normal and Hypophysectomized Rats" (*ibid.*, vol. 118, 1952, pp. 188-95).

———"The Effect of Anterior Pituitary Extracts, Desiccated Thyroid, Growth-Hormone Preparations and ACTH on the Extractable Secretin of the Intestines of Hypophysectomized and Intact Rats" (*ibid.*, vol. 119, 1953, pp. 266-73).

EZE, W. C. "Cause of Survival of Dogs without an Hepatic Artery" (*Archives of Surgery*, vol. 65, 1952, pp. 684-92).

KERR, E. H., STEARS, J. C., MACDOUGALL, I., and HAIST, R. E. "Influence of Gonads on Growth of Islets of Langerhans" (*American Journal of Physiology*, vol. 170, 1952, pp. 448-55).

KINASH, B., MACDOUGALL, I., EVANS, M. A., BRYANS, F. E., and HAIST, R. E. "Effects of Anterior Pituitary Extracts and of Growth Hormone Preparations on the Islets of Langerhans and the Pancreas" (*Diabetes*, vol. 2, 1953, pp. 112-21).

MARKOWITZ, J. "The Hepatic Artery" (*Surgery, Gynecology and Obstetrics*, vol. 95, 1952, pp. 644-6).

MARKOWITZ, J., LOTTO, W., ARCHIBALD, J., and DOWNIE, H. G. "Simple One-Stage Method of Hepatectomy in the Dog" (*Archives of Surgery*, vol. 64, 1952, pp. 766-72).

———"Technique and Effects of Portacaval Anastomosis (Eck Fistula)" (*Surgery, Gynecology and Obstetrics*, vol. 95, 1952, pp. 407-10).

MONKHOUSE, F. C., FIDLAR, E., and BARLOW, J. C. D. "Release of Heparin in Anaphylactic Shock in Irradiated and Non-Irradiated Animals" (*American Journal of Physiology*, vol. 169, 1952, pp. 712-20).



- RAPPAPORT, A. M. "The Guided Catheterization and Radiography of the Abdominal Vessels" (*Canadian Medical Association Journal*, vol. 67, 1952, pp. 93-100).
- RAPPAPORT, A. M., BOROWY, Z. J., and LOTTO, W. N. "Experimental Hepatic Coma"; in *Surgical Forum*, vol. 4, pp. 504-10. Philadelphia, Pa.: Saunders. 1953.
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## Psychiatry

*Under the direction of Professor Aldwyn Stokes*

### *General considerations*

Psychiatry concerns itself with breakdown in human living. Man as a physical entity develops in a life scene of which he is continuously a part. In development he ingests the means of molecular reorganization within the architecture of his organ systems; in development he incorporates the impressions and meaning of his world within a personal plan of general expectancies, attitudes, and action. In both instances, the one labelled a physical, the other a psychological process, there is a dynamic individual reaction to environment which constitutes the core of effective existence. Both dynamisms function together, not alongside one another but in intimate engagement, so that neither can continue separately as an expression of a full life. Whenever the full life is threatened or harmed or made unwholesome, disturbances may be described and understood in both physical and psychological terms.

Unfortunately there is a disparity in precision both of description and understanding when physical and psychological terms are employed. Physical abstractions issue from a century of triumphant technology; psychological abstractions by comparison are naïve and without equivalent technical support. Because of this disparity medical practice naturally favours the present strength of its physical techniques and sometimes, as naturally, disparages the present weakness of an undeveloped psychological science. But the problems of all ill people confronting physicians in intimate privileged engagement with human frailties will be contained only when the physical and psychological abstractions are reunited in a unity of knowledge.

The course of unification will suffer impedances and is bound to be slow and hesitant. The physician will continue to preserve an inviolate doctor-patient relationship while seeking more and more the help of other arts and sciences to prime his responsibilities for health. The physician's increasing dependency on the chemist and physicist is manifest: as surely his need in the future for the strengths of psychology and sociology will become equally apparent.

Psychiatry, from the very nature of the presenting problems of breakdown, already is interested in psychological and sociological developments while deriving its vitality from the "corpus medici." While continuously adding to its growth in symbiosis with the physical sciences, psychiatry has a lien on the results of vigorous and competent research efforts in the social-psychological fields.

Previous reports have attempted to outline the responsibilities of a university department of psychiatry, and the sustaining philosophy of endeavour in the face of such gigantic medical problems as schizophrenia, depressive illness, neurosis, psy-



chomatic illness, and character disorder. Now the issue of physical-psychological dualism is raised again because there lies perhaps the greatest and most dangerous impediment to progress on a broad front. A denial, explicit or implicit, of the inalienable alliance of physical and psychological domains, a mistrust of each other's weapons and usages, make up a schism which threatens the unity of an over-all medical purpose against the ills of mental and nervous disorders.

The Department of Psychiatry, in league with other University departments, has attempted to give vital expression to a truly integrative approach. The patient presents himself with his complicated problems of living from which issues a simplified symptomatology. To put that symptomatology in its proper framework, to be concerned with the diverse relevancies of associated processes, to bring to bear well-founded knowledge from multiple sources, to preserve throughout a basic human relationship, represents the art of service. To expound by precept and example, admitting ignorance while witnessing knowledge, represents the discernments of teaching. To test and retest hypothesis represents the discipline of research. But service, teaching, and research in human behaviour are not limited to one language or one system of ideas. Therefore, as an article of academic faith, psychiatry must seek truth wherever it is to be found and, as a corollary, must look for and develop strengths in the psychological and social fields. Here lies the explanation of a variety of activities which, at first sight only, seem remote from pressing and unrelieved responsibilities in mental health.

### *Particular considerations*

The Minister of Health of the Provincial Government has announced his intention to support the establishment of a new Psychiatric Institute. In conjunction with the University of Toronto the Institute will be devoted to the best service, training, and research efforts in the field of mental health. A committee of development has been established and plans are being considered.

In the meanwhile the Mental Health grants are being devoted in maximum degree to the training of specialists in psychiatry and to research. Thirty graduate students are in training spread over a four-year programme. During 1952-3, 9 physicians obtained the diploma of Psychiatry, while 9 diplomates of previous years obtained their Specialist certification.

Three senior graduates have expanded their experience abroad. Two foreign students and three from Canadian provinces, other than Ontario, have received tuition in Toronto. These numbers show the beginnings of a healthy development beyond parochial limits.

The graduate training organization has been expanded to include the psychiatric division of the Toronto Western Hospital and the Brookside Hospital and Clinic (Alcohol Foundation). Altogether there are now nine centres of instruction within the University framework of medical education. Clinical teachers and tutors are appointed in each centre with an important emphasis on individual supervision and maturation in psychiatric practice. The various centres together make up a diversified experience for the future psychiatrist and cover all aspects of mental disorder. Of particular value are the general hospital assignments and those in a paediatric and legal setting.

Instruction in the sciences basic to psychiatry proceeds alongside the clinical experience. Physiological and neurophysiological studies have been further developed under Dr. J. Lovett Doust recently appointed as Assistant Professor. Neuropathology in its psychiatric emphasis has continued under the aegis of Professor Eric Linell aided by Dr. D. Wollin (Department of Radiology). Biochemical investigations have continued in a separated metabolic ward unit in association with Dr. A. G. Gornall of the Department of Pathological Chemistry. Psychological studies under Dr. B. Quarrington and Sociological studies under Mr. J. Seeley and Mr. Sim have been very active. Mr. Farrell Toombs (of the Institute of Business Administration, re-



cently appointed Associate) has represented a valuable contact with the social sciences as they pertain to industry and business.

A full range of ancillary psychiatric services provides the means of developing effective colleagueship for the embryo psychiatrist. In particular Miss E. Bregg (Superintendent of Nurses) and Miss O. Griffith (Lecturer, School of Nursing) have linked the training programmes for nurses to the graduate training of doctors. Mr. M. Teicher (Assistant Professor, School of Social Work), too, has been effective in co-ordinating medical and social services.

Medical undergraduate instruction in Psychiatry continues to reveal many defects and it cannot yet be said that the newly graduated doctor has achieved a competence in dealing with the general psychiatric problems of ordinary family practice. Work is continuing to improve this area of training responsibility.

The Medical Faculty Council, the members of the Academic Council, and the Medical Alumni have maintained an interested understanding and support of the psychiatric developments throughout the year. In association with such extrinsic goodwill, the intrinsic relationships between colleagues have been stimulating and sustaining.

In conclusion the record of the Department of Psychiatry over the past year reveals growth both quantitatively and qualitatively. The imperfections are equally manifest and remain as the strongest possible stimulus for future effort.

### RESEARCH

The metabolic problems of periodic catatonia have continued over the past year as a major research interest *in the biochemical field*. Dr. A. G. Gornall (Department of Pathological Chemistry) and Dr. J. G. Dewan with their clinical and technical co-workers have shown that different individual patterns of endocrine integration are associated with the catatonic mental disturbances; their work has brought a welcome light into the murk which surrounds the use of ACTH and cortisone in schizophrenia.

Dr. J. Lovett Doust has initiated a very active research programme, both *biochemical and physiological*, into those aspects of physical and functional immaturity significant for an understanding of neurotic and psychotic disorders. The primary focus of his investigations has been that of capillary physiology with the relating of low oxyhaemoglobin levels in capillary blood to disturbances of mentation. A stroboscopic technique offers hope of modifying mental disturbance by general effects on capillary functioning. Mr. H. Husdan, associated with Dr. Doust's inquiry, is investigating the significances of foetal haemoglobin in the capillary oxidative processes.

Dr. Doust's group of workers, with aid from the Insulin Fund, are investigating the relationships between hypoglycaemia and anoxic anoxia particularly in the schizophrenic group of patients and in patients with "spontaneous hypoglycaemia."

*Neurophysiological studies* continue under Dr. J. E. Goodwin and Dr. A. Bonkalo. In particular alpha wave incidence and rate as seen in electroencephalographic records have been investigated in patients submitted to electro-convulsive therapy and leucotomy. The alpha rate is emerging as an important index in prognosis. Further, the change of alpha rate appears as an important phenomenon in the dynamic physical processes of periodic catatonia. Further studies will concentrate on the relationship of this changing rate to associated variations in capillary oxidations. Dr. Bonkalo and Dr. R. G. S. Arthurs have completed a study on the effect of mysoline in psychomotor epilepsy. Mysoline is revealed as a drug of considerable value in those cases of psychiatric disorder associated with epilepsy.

*Psychological researches* have continued in the field of speech disturbance. A group of workers, Mr. E. Douglass, Dr. D. Cappon, and Dr. R. G. S. Arthurs, have found that carbon dioxide therapy has no specific effect on stuttering; side effects important for psychiatric theory are being elucidated. Mr. M. Hoshiko is working with Mr. Douglass on the mental effects of stuttering spasm. Dr. B. Quarrington has



continued his studies on small groups and has made an important contribution, through a series of ingeniously planned experiments, on the processes involved in group decisions. Mr. H. Wideman has worked with the Mosaic Test; further he has discovered important prognostic pointers to good result following leucotomy by using the Wechsler scale.

The *sociological researches* into the mental health aspects of a Toronto community have been concluded. Mr. J. Seeley, Mr. A. R. Sim, and their associates are assembling their material into final book form. Mr. Farrell Toombs, of the Institute of Business Administration, is investigating those dynamic interactions of an industrial group which precipitate psychiatric illness in a vulnerable minority.

Apart from these physical, psychological, and social researches *clinical inquiries* continue. The five-year leucotomy study is about to be published by Dr. A. Miller; Dr. D. Cappon has interested himself in the psychological upsets preceding natural spontaneous aborting; Dr. J. D. Armstrong is investigating some problems of alcoholism.

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#### Radiology

*Under the direction of Professor A. C. Singleton*

The teaching in the Department has been similar to that of the previous year, with considerable instruction in conjunction with the clinical departments, par-



ticularly in the final year, and participation in the postgraduate courses in Medicine, Surgery, Obstetrics and Gynecology, Oto-Laryngology, and Ophthalmology.

Four candidates were successful this year in obtaining their diploma in Medical Radiology.

Museum facilities at the Toronto General Hospital and Sunnybrook Hospital have been enlarged and improved.

The didactic teaching to third-year students remains unchanged.

### RESEARCH

Members of the staff have undertaken the following research work:

Professor C. L. Ash is conducting a study, in co-operation with the Departments of Surgery and Medicine, on the effects of bilateral adrenalectomy and oophorectomy on advanced carcinoma of the breast.

Dr. Vera Peters is attempting a study on a variety of compounds in the treatment of radiation sickness.

Dr. K. F. MacEwen, in conjunction with the surgical staff of the Wellesley Division, has been conducting clinical research on fractured hips.

Dr. C. A. F. Moes, in conjunction with Dr. I. B. Macdonald, has been conducting research on the effectiveness of cholecystography as a diagnostic procedure.

Dr. J. D. Munn has been continuing his research in pancreatic fibrosis and in the development of the cervical spine in children. Under the direction of Dr. Munn, further study is being carried out on the growth of the lower extremities in children, with and without poliomyelitis.

The facilities of the Department of Radiotherapy have been made available to the Departments of Physiology and Hygiene, in various animal experiments.

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## Surgery

*Under the direction of Professor R. M. Janes*

There has been no important change in the undergraduate teaching programme. Much thought is being given in the Department, however, to ways in which it might be improved. The inadequate amount of operating room space makes it almost impossible for the members of the staff to arrange their time to advantage, and in spite of the best intentions, teaching schedules are sometimes encroached upon. In the properly appointed university hospital it should be possible for members of the surgical staff to be assigned specific times for both public and private operating, thus conserving time for teaching and research. Before this can be done there must be a great increase in the number of operating rooms available. Building programmes at present underway or contemplated should improve this situation. With the ever increasing demands of undergraduate and graduate teaching and research, the best possible use of the surgical teacher's time has become essential. Among interesting suggestions received from a student committee which undertook the study of undergraduate teaching was a request for clinical lecture demonstrations upon surgical therapy. Actually a number of these were instituted a few years ago in an effort to



cover uncommon surgical conditions and those which tended to be segregated into special departments such as mouth, lip, and tongue cancer. These demonstrations have worked well. An effort is to be made next year to extend these and make greater use of out-patient material.

The residency training programme continues to attract a sufficient number of applications but the back-log left from the war has been taken care of and it is no longer necessary to defer most applications. It is gratifying that with the large number of appointments available in the United States and the far larger remuneration that trainees may expect from such posts, there continues to be a sufficient number of applicants of a high type. Many graduates from other schools in Canada and abroad lend variety and interest for both residents and staff. At the 1952 examinations of the Royal College, Dr. W. G. Beattie, Dr. R. W. Cram, Dr. P. O. Crassweller, Dr. A. J. Kergin, Dr. W. J. McCracken, and Dr. H. M. Wallis obtained Fellowship in General Surgery; Dr. J. M. Lessard and Dr. Ian Macnab in Surgery with emphasis on Orthopaedic Surgery; Dr. C. W. Taylor in Surgery with emphasis on Neurosurgery; and Dr. A. S. Tauber in Surgery with emphasis on Urology. Certification in General Surgery was awarded to Dr. T. Y. Chang and Dr. W. E. French, and in Orthopaedic Surgery to Dr. Jean Leclerc. Dr. W. J. McCracken was granted the M.S.(Toronto) and awarded the Lister Prize, his thesis being on "Clinical Aspects of the Oximeter." Dr. E. A. Ryan was also granted the M.S.(Toronto), his thesis being "Recurrent Herniae." Doctors G. S. Cameron and G. A. Trusler, who were attached to the Department of Physiology for a year in basic science, obtained their B.Sc.(Med.) on the basis of the year's work.

The advanced graduate course in Surgery extended from August 25 to October 10, 1952. Members of the Department participated in the annual graduate meeting sponsored by the Medical Alumni Association. The usual number of addresses to local societies including those sponsored by the Kellogg Foundation have continued.

The 1952 Balfour Lecture was delivered in Convocation Hall on September 29 by Mr. Clifford Morson, O.B.E., F.R.C.S., Consulting Urologist, National Health Service, and Chairman of the Academic Board of the Institute of Urology, University of London. His subject was "Ill Health and History."

Doctors W. G. Bigelow and J. R. F. Mills have been promoted to the rank of Assistant Professor and Doctors C. S. Day, N. C. Delarue, and W. T. Mustard to the rank of Associate. Dr. J. D. Mills and Dr. G. M. Dale of Sunnybrook Hospital have been appointed Clinical Teachers in recognition of the excellent service they have rendered in graduate teaching. Dr. D. R. Bohnen has been made a Clinical Teacher in order that he may participate in undergraduate teaching.

Following a year abroad on McLaughlin Fellowships, Doctors W. A. Brown and Owen Gray will return on July 1 to join the staff of the Western Hospital, Doctors W. K. Lindsay and James Simpson to the staff of the Hospital for Sick Children, Dr. C. B. Baker to the staff of St. Michael's Hospital and Doctors W. R. Harris and H. R. Gallie to the staff of the General Hospital. Doctors W. M. Lougheed and W. J. Horsey have been awarded McLaughlin Fellowships to study neurosurgery, Dr. Lougheed in Boston and Dr. Horsey in Europe. Dr. W. R. Harris has been given a McLaughlin Research Fellowship to conduct further investigations into the etiology of slipped epiphysis and the influence of cortisone on the structure and strength of the epiphyseal plate. This work will be carried out in the Department of Anatomy in association with Professor Ham. Dr. Leo Mahoney has also been awarded a McLaughlin Fellowship which will enable him to spend a year in Europe before returning to the staff of St. Michael's Hospital and Dr. John Callaghan has received an award which will enable him to study cardiac surgery in England with Sir Clement Price Thomas. The generous awards of this Foundation have meant much to these young men and will be felt in the future in the University.

The Roscoe Reid Graham Travelling Fellowship has been awarded for the first time this year to Dr. Peter Crassweller to enable him to visit urological centres in Europe and the United States before returning to join the Division of Urology at



the Western Hospital. This scholarship has been made available by Mrs. Graham, Mr. Barry Graham, and Mrs. Peter Allen and is to be awarded every three years for study outside Canada to "that graduate in Medicine who has completed at least three years of postgraduate study and who has the qualities which will, in the opinion of his teachers, ensure his success as a surgeon and as a clinical teacher." Dr. W. G. Beattie, who completed his training with us last year, has been able to spend some time in England on a J. S. McEachern Fellowship from the Canadian Cancer Society studying malignant disease. Upon his return he will practise in Ottawa.

During the year Dr. L. T. Barclay has been President of the Canadian Society of Plastic Surgeons; Dr. C. W. Harris has succeeded Dr. Stuart Gordon as President of the Toronto Academy of Medicine; Dr. D. R. Mitchell has been President of the Northeastern Section of the American Urological Association and is President-Elect of the Canadian Urological Association. Dr. Ian Macnab was awarded the 1952 Medal of the Royal College of Surgeons of Canada for his thesis entitled "Structural Changes in the Lumbar Spine." Dr. W. G. Bigelow has been elected to the Society of University Surgeons, Dr. F. G. Kergin was elected a Fellow of the American Surgical Association, Dr. D. C. Robertson has become a member of the Canadian Association of Plastic Surgeons, and Doctors R. C. Laird, C. S. Day, C. J. Robson, and W. K. Welsh have become Fellows of the American College of Surgeons. Dr. R. M. Janes was President of the American Association for Thoracic Surgery, became a Regent of the American College of Surgeons, and received an honorary degree of Doctor of Medical Sciences from Laval University.

## RESEARCH

*Reported by Professor R. M. Janes*

Dr. W. G. Bigelow, in co-operation with Dr. A. G. Gornall of the Department of Pathological Chemistry and Dr. George Trusler, has continued work on hypothermia in relation to hibernation. He has also completed a study on revascularization of the heart using an internal mammary artery transplant after the manner of Vineberg.

Dr. E. H. Botterell, in collaboration with Dr. John Scott and Dr. Gordon Cameron (D.V.A. Research Fellow), has continued the investigation of physiological disturbances in the paraplegic patient. Diaphragmatic respiration has been studied and Dr. Cameron with Dr. Scott has pursued the problem of automatic responses in paraplegic patients in the Department of Physiology using spinal cats. Dr. Botterell and Dr. Scott are conducting clinical research in the problems of ruptured berry aneurysms of the vessels comprising the circle of Willis. A pressure-recording apparatus has been used to study a number of patients in whom ligation of the common or internal carotid artery was carried out in the neck. This has been of great assistance in deciding whether to undertake ligation of these arteries. In collaboration with Dr. William Horsey a survey of patients with diabetes insipidus and presenting neurosurgical problems has been conducted. The equipment now being available, Dr. Tom Morley has begun the development of the use of the Geiger counter brain needle.

Dr. W. T. Mustard, in collaboration with Dr. A. L. Chute and with the assistance of Dr. George Stobie and Dr. Anna Sirek, has continued the investigation of extracorporeal circulation. Interauricular defects similar to those lesions encountered in congenital heart disease have been created under direct vision in dogs.

Dr. Ian B. Macdonald with the assistance of Dr. P. P. Gagnon has continued the work on homologous renal transplants in dogs. A large series has been completed and detailed histological studies are being made on the grafted specimens by Dr. John Barrie of the Department of Pathology. A series of diodrast arteriograms and intravascular injections of india ink have been performed in an effort to assess the adequacy of the circulation through the transplants.



Dr. G. H. C. Joynt is endeavouring to produce emphysema experimentally in dogs.

Dr. A. W. Farmer with Dr. W. R. Franks of the Department of Medical Research has continued his research on burns.

Dr. J. E. Gendron, under the direction of Dr. F. I. Lewis and in association with the Department of Pathological Chemistry, has continued the work upon ulcerative colitis and during the past year some encouraging progress has been made. Dr. Lewis has also been doing a clinical investigation of the post-gastrectomy syndrome. Dr. J. D. Mills at Sunnybrook Hospital has completed an extensive review of the results of surgery in peptic ulcer. The reports of this work, as well as of some special investigations into the cause of the post-gastrectomy syndrome and an operation for its relief, will be published shortly.

Dr. E. B. Tovee with the assistance of Dr. Gendron has continued work upon fractures of the neck of the femur in dogs; radioactive phosphorus ( $P_{32}$ ) is now being used in the study of the healing of fractures and the detection of dead bone. It is planned to use radioactive calcium in a similar problem.

Dr. F. G. Kergin and Dr. James Key with the assistance of Dr. Yves Martineau have been investigating a method of restoring arterial blood supply to the heart in dogs.

Dr. F. P. Dewar with the assistance of Dr. Michael Harrison has initiated studies of the mechanisms controlling synovial joint effusions which follow traumatic injuries. A movie recording techniques and microscopic findings in living synovial tissue is being completed. Under the direction of Dr. R. I. Harris and Dr. Ian Macnab, Dr. Michael Harrison has continued the low back pain studies. Attention was directed to the cervical spine for comparison with and contrast to the lower spine sources of pain. The clinical picture of cervical pain and the findings on X-ray examination and post-mortem dissection are being studied. Some clinical applications of observed facts have been found and are being tested.

Dr. N. C. Delarue, with Dr. C. L. Ash of the Department of Radiotherapy and Dr. W. T. W. Clarke of the Department of Medicine, has begun an investigation of adrenalectomy in the treatment of metastatic mammary cancer. It is hoped that further knowledge of the clinical and chemical effects of adrenalectomy in the human may also be obtained through this study.

A detailed analysis and follow-up study of all cases of breast cancer treated in the Toronto General Hospital and the Department of Radiotherapy has been underway for more than a year and should be ready for publication in the near future.

Numerous clinical investigations have been undertaken by members of the surgical staff. A number of these have been presented at staff meetings and some will be published in due course.

This programme of research is made possible through the friendly co-operation of many other departments, without whose assistance many of the investigations could not be carried to finality. Financial assistance from the National Research Council, the Defence Research Board, the J. P. Bickell Foundation, the Ontario Cancer Treatment and Research Foundation, and the Canadian Life Insurance Officers Association is gratefully acknowledged.

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## Therapeutics

*Under the direction of Professor K. J. R. Wightman*

The teaching programme in the third and fourth years has been carried out with the aid of Drs. Forman, Walsh, and Prueter, Assistants in the Department, and Dr. K. Butler, Fellow in Therapeutics. In addition, lectures on special subjects have been given by various members of the Department of Medicine. The teaching in physical medicine has been carried out under the direction of Dr. Gardiner and Dr. Jousse.

Therapeutics is a rapidly expanding and changing subject and one in which the students have tremendous difficulty in orienting themselves. One of the greatest difficulties in teaching the subject is that of giving the students a sense of continuity in the management of an individual patient so that they can appreciate the modifications in treatment which may be necessary from day to day as the picture changes. The most valuable part of the course appears to be the series of theatre clinics which is given with discussions on the management of individual patients. In these, the attempt is made to present the problems and decisions which are needed in a way which at least to some extent resembles situations which the physician may encounter in actual practice. This can never be wholly accomplished, of course, even during an internship, but it is hoped that some stimulus to the intellect and imagination of the students may be provided which will help them appreciate the scope of the subject. Every effort is made to make the course dovetail with that given in medicine.

## RESEARCH

Members of the staff have undertaken the following research work:

Dr. C. J. Bardawill, National Cancer Institute Fellow, has continued his investigations of metabolic and biochemical alterations occurring in leukaemia and malignant disease and modifications produced by treatment. Studies of phosphorus turnover in the various chemical fractions of leucocytes have been carried out with the co-operation of the Departments of Biochemistry and Pathological Chemistry. Measurements of red cell arginase, plasma tyrosine, arginine, cholinesterase, and total amino acids in a wide group of patients have been carried out. Dr. J. Finlay, working on a fellowship of the National Research Council, has studied the effect of cortisone on fat and carbohydrate absorption in steatorrhoea. The validity of the xylose tolerance test as a measure of carbohydrate absorption is being investigated, and the use of a gluten-free diet in therapy is being studied. Various aspects of calcium metabolism have also been investigated. Dr. K. Butler, Fellow in Therapeutics, has been working on problems of immuno-haematology, and also studying the iron content of bone marrow in various diseases, using staining techniques.

## PUBLICATIONS

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## Division of Physical and Occupational Therapy

*Under the direction of Dr. A. N. Zinovieff*

Once again more than one hundred students enrolled in the first year of the course. The work of the Division has proceeded satisfactorily, though a certain



amount of difficulty was experienced because of the numbers in the course and the shortage of available placements for practical training in Occupational Therapy. It is to be hoped that this problem will be eased in the near future when the departments of the Toronto General and Toronto Western Hospitals will have been expanded. In the meantime, all the hospital departments have been most helpful and co-operative in making the best possible arrangements, often taking far more students than they could cope with easily. Through the continued and kind interest of the Faculty of Medicine the medical and surgical lecture demonstrations have been of a high standard and greatly appreciated by the students. As all the doctors concerned really get the feel of lecturing to these students it can be assuredly said that the course of instruction in medical and surgical subjects will have no better anywhere.

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### *Banting and Best Department of Medical Research*

*Under the direction of Professor C. H. Best*

Professor C. C. Lucas, Dr. Jessie H. Ridout, and Professor Best have continued their studies of the effect of dietary cholesterol upon the liver and serum cholesterol of rats. They have also been attempting to produce in rats a condition similar to "kwashiorkor," which is the most widespread of all human nutritional diseases.

Professor G. A. Wrenshall, with Miss Margaret Henderson and Mr. Louis Lax, has measured the extractable insulin and fat of the human pancreas at autopsy, in a large new series of cases. This group has also studied the course of spontaneous diabetes in three dogs, and in two of these the insulin extractable from pancreas has been measured. The extractable insulin of pancreas from four additional dogs with spontaneous diabetes mellitus (plus two non-diabetic controls) has been estimated for Dr. H. T. Ricketts, University of Chicago. Samples of many tissues from these animals were taken at autopsy for histological study by Professor W. Stanley Hartroft. As was reported before the Toronto Diabetes Association, all of the diabetic dogs studied thus far have had extremely low levels of extractable pancreatic insulin. The spontaneously diabetic dogs are characteristically old (6-12 years). The findings indicate that this type of diabetes in the dog is not a satisfactory prototype of the maturity-onset diabetes of human subjects.

In order to carry on work with radioisotopes, two small roof laboratories were assembled by the Superintendent's Office (under the direction of Dr. Wrenshall and Mr. C. R. Cowan) and completed in October, 1952, when a cold unit was installed and the hood draft velocity was brought up to official requirements. Administration of one of these laboratories was then turned over to Dr. Bruno Rosenfeld. A new Geiger-Mueller counter system was also put into operation at this time. A closed-circuit respirometer for total metabolism experiments on rats has been designed and is nearing completion. Analyses of the chemical constituents of serial gas samples obtained in pilot runs with this unit are being made by mass spectrometer.

Miss Jessie M. Lang has been assisting Dr. Rosenfeld with a study of the possible role of coenzyme A in lipotropic phenomena.

Dr. Jean M. Patterson has supervised the preparation of the many synthetic diets used in various nutritional studies conducted in the Department. She has also performed countless chemical determinations upon the lipid fractions extracted from the organs of animals used in the lipotropic studies.

Mr. R. T. B. Lawrence, Mr. J. M. Salter, and Dr. Best have been carrying on a



series of investigations to study further the effects of insulin in the absence of the pituitary gland. Already it has been found that daily subcutaneous injections of protamine zinc insulin will, in the complete absence of growth hormone, produce a marked increase in the weight of the rat and a proportionate increase in the weight of the heart, liver, thymus, and kidneys. Also there is a definite increase in skeletal growth in these animals. Thus for the first time it has been established, by this and previous investigations in this laboratory, that insulin may function as a growth hormone acting without the pituitary growth substances to build up and conserve body tissues.

Studies on the experimental production of hepatic coma have been continued by Dr. A. M. Rappaport and Dr. Malcolm H. Macdonald. Experiments to increase the blood supply to a failing liver are in progress. Some of the biochemical changes in the comatose animals were investigated by Mrs. N. M. Danoff in the Department of Pathological Chemistry. It was found that dogs surviving the operation for producing hepatic coma displayed a marked sensitivity to barbiturates. Therefore studies of the blood levels of pentothal in these as well as in normal animals following intravenous administration of this drug, were undertaken with Dr. Rosenfeld. The investigations, with Dr. W. G. B. Casselman, of hepatic blood flow in normal animals and in those that had undergone operative procedures, were completed. Dr. Macdonald also studied the anatomy of the pancreatic duct system in fifty dogs and devised a technique for the safe ligation of the main and accessory pancreatic ducts.

Dr. G. R. Williams has been investigating the lipaemia-clearing activity of heparinized plasma. By fractional precipitation with ethanol at low temperatures, a fraction was isolated which reduces the turbidity of lipaemic sera *in vitro*. The kinetics of this process have been studied. Prior incubation with the alpha-toxin of *Cl. welchii* was found to inhibit the clearing reaction. Conversely, pre-treatment of human fasting sera with the active preparation suppresses the increase in turbidity that occurs upon incubation with this toxin.

Dr. Otakar Sirek continued his studies on the role of insulin in the metabolic action of growth hormone. Using different preparations he has found that a single injection of any brand of highly purified growth hormone is able to produce a significant fall of the blood sugar level in totally depancreatized diabetic dogs kept for as long as ninety-six hours without exogenous insulin supply. It seems that under certain circumstances growth hormone itself may be able to stimulate carbohydrate metabolism and that neither an extra secretion of insulin nor the presence of any amount of insulin is necessary to accomplish this lowering of the blood sugar.

Dr. R. E. Semple, working under the general direction of Professor A. L. Chute, has continued his investigations of plasma substitutes and has given special attention to a number of dextran preparations. The effect of these preparations on normal animals has been studied. In severely anaemic animals, adequate infusion of dextran solutions has resulted in the prevention of shock. It is not yet clear how long after haemorrhage dextran therapy can be delayed, and the experiments in progress are designed to answer this question. The metabolism of dextran is receiving attention in another series of experiments. In co-operation with the Toronto General Hospital, the Hospital for Sick Children, and the Connaught Medical Research Laboratories, dextran of Canadian manufacture has been given clinical trial for the first time.

Dr. Casselman continued his histochemical investigations. With the technical assistance of Mr. O. T. George, over 5,000 tests were performed. The histochemistry of the phospholipids was studied extensively. New or improved procedures were developed. Histochemical methods were applied in studies of problems concerning deficiencies of choline and of essential fatty acid. Among these studies were two cases of Whipple's disease (with Professor J. D. Hamilton, Department of Pathology), mixed tumours (with Dr. W. Anderson, Department of Pathology), and liver biopsies of patients with hepatic diseases or diabetes mellitus (with Dr. A. Bogosh and Dr. H. L. Bockus, University of Pennsylvania). Assisted by Mrs. H. J. Hausler, Dr. Casselman has completed his studies of essential fatty acid deficiency in rats. Previous



observations on factors influencing the formation of ceroid were extended by experiments on the effects of dietary antioxidants upon the hepatic deposition of this pigment in choline-deficient rats. Histological assessment of the cirrhosis in these animals has been compared with chemical estimations of collagen in their livers. The production of choline deficiency in guinea-pigs was achieved in collaboration with Dr. Williams. The marked effect of pituitary growth hormone upon the development of fatty livers in choline-deficient rats was investigated with Mr. Salter. Studies with Dr. Rappaport on the estimation of hepatic blood flow in dogs were completed. Dr. Casselman has also continued to work with Dr. T. F. Nicholson of the Department of Pathological Chemistry on the renal excretion of electrolytes.

Dr. W. J. Linghorne's studies have shown that oral structures have definite advantages for observing bone growth. The inhibition of growth by hypophysectomy is clearly apparent in sections of the teeth. The same is true of the acceleration of growth by growth hormone. Histologically the growth process appears almost identical with the reparative process. If this proves to be true, it permits a study of the factors affecting repair using small animals such as rats, where injury is difficult to produce and measure accurately. Dr. Linghorne has also extended his productive work on reattachment of the supporting structures of the teeth.

In the sub-department of Synthetic Chemistry, under the direction of Professor Erich Baer, the following research work has been carried out. Dr. D. Buchnea continued his work on the synthesis of unsaturated  $\alpha$ -lecithins and has obtained samples of dioleoyl L- $\alpha$ -lecithin which analysed correctly and on reduction gave the well-known distearoyl L- $\alpha$ -lecithin. Another promising method for the synthesis of saturated and unsaturated  $\alpha$ -lecithins is under investigation. The synthesis of glycollecithins, a new class of phosphatides, has been continued and their serological properties are being investigated in association with the Department of National Health and Welfare. Mr. H. C. Stancer and Mr. J. Maurukas have made essential contributions to these problems.

During the current year the following work has been carried out under the direction of Professor W. R. Franks. The chief activity in the cancer research programme has centred around the findings previously reported that a diet consisting of milk treated with hydrogen sulphide, followed by peroxide to remove excess sulphide, results in a marked increase in susceptibility of S 37 tumour to X-ray. The current programme has been directed toward differentiating the various factors involved and it now appears that the excess hydrogen peroxide added to the diet is the chief factor. The number of cures following 1300 r. X-ray has been increased threefold. The influence of thyroxine in speeding up the effect (or the converse with thiouracil) is also under study. Splenic extracts do not appear to alter the results but the exhibition of ethylenediamine tetraacetate, a cation chelating agent, seems to produce a similar result which, however, does not appear to be additive with that following peroxide feeding. These investigations are being carried out by a team of the following workers: Mr. Charles Lennox, Miss M. M. Shaw, Mr. John Skublics, Mr. Karl Wunderlich and Miss A. M. McGregor. At the present time approximately 200 animals are radiated each week, radiation being carried out with the co-operation of the Department of Radiology, the Toronto General Hospital.

With Mr. G. A. Meek, the influence of modifying the behaviour of ions formed within the tumour as a result of irradiation, by the simultaneous application of an electrostatic, magnetic, or electromagnetic field, is currently under investigation. Preliminary tests would indicate that a magnetic field of 200 gauss is not sufficient to alter the response.

Also in the field of tumour immunity, Mr. A. Rodgman has been studying the possibility of hapten conjugation with the use of methylene di-isocyanate with various tissue fractions and protein substrates. Although satisfactory evidence of chemical conjugation has been obtained, the biological results with products produced to date have been disappointing.

On behalf of the Defence Research Board, studies are continuing with Mr. Meek,



directed toward the development of a rapid photoelectric method of assessing the level of adrenal cortical activity. Many difficulties have been encountered. Under the same auspices, with Mr. T. Shimizu, Dr. Franks has been investigating methods of detecting whether or not fatal aircraft accidents were caused by lack of oxygen at the time. The problem is to differentiate post-mortem anoxia from failure of oxygen supply occurring before the accident. The experimental animal work has satisfactorily validated the approach, and methods of practical application to the problem as encountered in the field are presently being worked out.

Activities in Professor Hartroft's section may be presented in four parts. (1) Research in the field of experimental and clinical diabetes has been conducted in close collaboration with Dr. Wrenshall. In 80 diabetics and 86 non-diabetics coming to autopsy, Dr. Hartroft has established a highly significant correlation between the numbers of granules in the beta cells of the islets of Langerhans and the amount of extractable insulin measured by Dr. Wrenshall. Dr. Hartroft has observed lesions in choline-deficient rats' kidneys, resembling those commonly encountered in glomeruli of human diabetics. The importance of fat emboli as an ætiologic agent in the production of both experimental and clinical renal lesions has been demonstrated in these studies. (2) In association with Drs. Best, Lucas, and Ridout, Dr. Hartroft has observed arteriosclerotic changes in the aortas and hearts of choline-deficient rats. Further investigations in this field are planned. With Dr. G. Wilgram, Dr. Hartroft has also studied the production of cardiac necrosis in younger choline-deficient rats. This observation further links hypolipotropic diets to some of the heart, liver, and kidney lesions seen in kwashiorkor which is prevalent in "protein-poor" regions of the world. (3) Mrs. P. Merritt Hartroft has continued her studies of the endocrine organ within the kidney: the accumulation of juxtaglomerular cells. She has now established a highly significant correlation between numbers of granules in these cells and the width of the zona glomerulosa of the adrenal cortex under a number of experimental conditions. (4) The section has provided histological services and photomicrographic facilities for all members of this Department and of the Department of Physiology.

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